



IMPERIAL INSTITUTE
OF
AGRICULTURAL RESEARCH, PUSA.

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No. 4041

FRIDAY, MAY 2nd, 1930

VOL. LXXVIII

*All Communications for the Society should be addressed to the Secretary, John Street,
Adelphi, W.C.2.*

NEWS OF THE WEEK

"As with individuals, so with the State. National wealth, which in the highest sense of the word means the enrichment of the lives of the people, depends not on how large a number of incomes there are of over ten thousand a year, but on how small a number there are of under two hundred a year. The real riches of a nation are not to be measured by vast calculation of commercial statistics, but by the absence of destitution and the high level of healthy life which the people enjoy."

Lord Ponsonby.

"As no insect is without its rights and every cripple has his dream of happiness, so no artistic fact, no child of imagination is without its small birthright of beauty. In this freer element competition does not exist and everything is Olympian. Hungry generations do not tread down the ideal but only its spokesman or embodiments that have cast in their lot with other material things. Art supplies constantly to contemplation what nature seldom affords in concrete experience—the union of life and peace."

George Santayana.

Our President.—The Royal President of the Society returns from his customary sojourn in the South of France to celebrate his eightieth birthday in London, where he was born at Buckingham Palace on May 1st, 1850.

Although in many ways remaining true to the traditions of the 19th century, His Royal Highness has always shown his anxiety to keep in touch with all the changes and developments in the modern world and serve the Nation and Empire.

The Duke's period of office in Canada was marked by wise statesmanship and he entered into all the problems and ambitions of that great Dominion with enthusiasm. It is sixty-two years since he entered the Army and his work in all the varying commands will be recounted from more informed sources.

He succeeded his brother, the late King Edward as the Head of this Society for the encouragement of Arts, Manufactures and Commerce, and the present Council wish, on behalf of the Fellows of this increasingly active Society, to offer to His Royal Highness their congratulations on the occasion and wish him the enjoyment of a continued period of health which will enable him to remain the Head and inspiration of the Society.

The Laureateship.—The death of the Poet Laureate has been a great event of the past week. It is only recently that Mr. Robert Bridges produced an epic which was acclaimed by all real lovers of poetry as likely to be a permanent contribution to English literature. He never would write on special occasions and in consequence was constantly subjected to unworthy criticism as to his inadequacy. Who is to be his successor? So many names spring to one's mind, but it is very difficult to find any clue to the ultimate choice. When Robert Bridges was appointed there were many who, quite justly, urged the claims of Rudyard Kipling and William Watson, both poets in the great sense. Blunden would no doubt have been the choice of Robert Bridges, and for that very reason his chances are small. Masfield would certainly be a popular appointment and he has every qualification for the post. Other names suggest themselves: A. E. Houseman, Ralph Hodgson, Humbert Woolf, though the two former have produced very little the last few years. We should say ultimately that the official choice would lie between Kipling, Masfield or Lawrence Binyon.

St. John's College, Battersea.—We wrote fully on this matter in our issue of April 4th. Since then there have been many references of protests in regard to the decision of the Battersea Town Council. We have received the following letter from Mr. Edwin Austin, the Town Clerk:—

“Your letter of the 11th instant with reference to the Principal's House at the above was considered by my Council at their meeting last evening, and in reply I am directed to inform you that the Council propose to clear the whole of the site and utilise it for housing purposes only.

I am to point out that preservation of the Principal's House would severely handicap the development of the estate, and further that the main items of historic interest (staircase and panelling), are not included in the sale."

From this, we gather that a scheme for the rebuilding has been prepared, and we shall be glad if the Town Clerk will allow the Council's architect to let us see this, so that we can see to what extent the Principal's House handicaps this scheme. The Society attaches no special value to the house torn from its setting. We show photographs of the two adjoining houses, which are also of considerable character.

Advertisements.—A correspondent who asks, for sufficient reasons, that his name should not be mentioned (but who represents important English interests abroad) writes as follows :—

"In connection with the campaign which the Royal Society of Arts is conducting against unpleasant advertisements, you may be interested in the following letter I have received from Messrs. Sissons Bros. of Hull, and in the appended copy of my reply thereto."

"I have received a circular letter from you, posted in Belgium under date 7-4-30, which mentions the interest I may have taken in your life size, realistic 'Men and Plank,' to be seen at the side of every railway".

I have noticed these advertisements for some years, and during this time I have taken care never to buy one ounce of your products, and I have, moreover, been able to persuade many friends to adopt the same course, as a protest against your bad taste in desecrations of otherwise beautiful countryside."

Here is a copy of the circular sent by Messrs. Sissons Bros & Co., Ltd., Hull:—

"Our advertisements for 'Hall's Distemper' in all the leading periodicals and Journal will, no doubt, be very familiar to you, and on your visits from Belgium to England, while taking that rail journey from the port to town, you will be interested in the life-size realistic 'Men and Plank' to be seen at the side of every railway.

This speciality, of course, is used in ever increasing quantities in this country, not only by private householders, but also for schools, hospitals, theatres, cinemas, and public buildings of every description. May we inform you that it is obtainable also in Belgium, in all the principal towns, and if you will drop us a postcard, we shall be very pleased to send you Shade Book, Brochure, and other particulars, and also the address of the nearest stockist.

There is just one point to remember, however. 'Hall's Distemper' is sold by us in most Continental Countries, under the special registered name of 'Matolin,' but the only difference lies in the name; the quality of our stocks in Belgium is just as excellent as that of the distemper we sell in this country."

Our correspondent's action may not have any appreciable effect on the sale of the particular distemper, so familiar to all builders, but the ultimate result of the





announcement in this Journal of his action may have far-reaching effects. If all the architects and builders associated with the innumerable Societies for the protection of Urban and Rural England will cease to specify Messrs. Sissons products until they withdraw their "Life-size, realistic 'Men & Plank,' to be seen at the side of every Railway," some progress will be made, and all local authorities will lose no time in availing themselves of the power given them to limit the display of unsightly advertisements in conformity with the ideas of the educated public they should represent.

We have called attention to the unsightly advertisements on the West Wycombe Railway Station at the request of many Fellows of the Society. We are making a list of the most conspicuous offenders against the regulations up and down the country, and hope shortly to publish a list especially of firms who desecrate the approaches to villages and open fields. Is it natural that in proportion to the beauty of the village or view, the aggressiveness of the hoarding seem more violent? The Beauty of England cannot much longer be allowed to be sacrificed to the rival claims of edibles. We shall return to the subject next week as a correspondent raises the question as to what would happen if a body of educated people sallied forth one night and tore down all the offending advertisement bills in their respective towns or villages.

The Fertility of England.—Sir Andrew Macphail, seen by a *Sunday Express* correspondent, said :—

"What impressed me was the devastation of Rural England—devastated by beauty alone. In a journey of four hours across the face of England, I saw only one man and two horses at work on the land, whereas there was not a field in Europe without horses, men, women, and children, cultivating the soil, sowing, and planting. And this English earth was more fertile than the plains of Belgium, where 45 bushels of wheat are grown on every acre. It was almost rich enough to put on one's bread instead of margarine."

Books.—Three widely different but notable books have come to our notice this week. The first is "Hammersmith Hoy" by Nigel Playfair, which as well as being an interesting biography, is the story of one of the most adventurous theatres in London. Sir Nigel Playfair with his sense of humour and his sense of the theatre and his sense of adventure has made a readable and delightful contribution to theatrical literature.

"A True Story" by Stephen Hudson, is a carefully written study of Richard Kurt and his reactions to life and love. It is rather refreshing in these days of dots and dashes and hastily written impressions to find a book so thoughtful and deliberate. Mr. Hudson is an excellent writer and if at times the novel is a little

too much drawn out, it makes very satisfactory reading. He is best in the passages which are not told by Richard himself, in which he seems a little forced and we feel that his style is too consciously impressionistic.

"The Party Dress" by Joseph Hergesheimer is frankly disappointing. Having been a fervent admirer of this author ever since "The Three Black Pennies" and "Java Head" appeared, we look eagerly for his return to the charm of these earlier books, but somehow the magic seems to be gone for the time and has been replaced by a more ordinary sophisticated writing of the average novel. And what magic there was in those earlier stories—almost genius in the description of a dress or a scene in a few swift strokes. "The Party Dress" has got a certain quality and may please those who have not read the others, but to those who loved the artist of "Java Head" it is a poor substitute. They say Hergesheimer has been writing for the films; if so, perhaps he will recover from the glare of Hollywood and get back to his old atmosphere.

Modern Art at the Leicester Gallery.—This is an exhibition of paintings by Leger, Metzinger, Severini and Viollier, with the addition of "Paintings in Space" by Kotchar. It is certainly modern; there are no half measures; so turn from it, all you who still cherish ideas about representation and tone values and any rules of art. You must visit this exhibition with an open mind, and put away all preconceived ideas. The paintings of Gino Severini are delightful and decorative without any need to get into a special mood and to try and find out exactly what was in the artist's mind, though no doubt according to Mr. Wilenski's preface, there was much more in it than meets the eye. But here the colour and compositions were really beautiful as in "Nature morte au bord de la mer."

For the rest we cannot do better than quote Mr. Wilenski, who sheds a good deal of light on the motive behind contemporary art. He says:—

"Leger Severini and Metzinger have taken the whole world of formal relationship as their material. They make use of theoretical related forms in machinery in the swiftly moving panorama of modern life, in accidental or arbitrary juxtaposition of objects in the studio, in rearrangement of the material used by the artists of the past.

"A nineteenth century romantic picture symbolised the artist's subjection of his intellect to his emotions.

"A twentieth century picture symbolises the artists subjection of his emotions to intellectual control.

"The artists assume that a picture which is conceived as an architectural construction of related forms has an æsthetic value above a picture which is conceived as the record of the artist's individual emotional reaction to some emotive fragment in life."

Viollier, the fourth artist in this modern quartet, gives us curious visionary ideas ranging from the Last Judgment to the mind of a poet. Of Kotchar's paintings in space we cannot attempt to say anything, as we were utterly at a loss to understand them either artistically, decoratively or intellectually.

The Films.—For those who are interested in comparing different types of film productions, there is a very decided contrast in English and American methods now to be seen at the Marble Arch Pavilion, where the “Green Goddess” is running together with a British production called “Dark Red Roses.” Looked at from an artistic rather than a patriotic point of view, the American film is very nearly perfect and the English one is amateur in the extreme and full of the most elementary faults both of sound and scenery, such as loud voices coming from distant figures and defective lighting. We could not have a better object lesson in film production than these two. Mr. Arliss repeats his stage triumph in the “Green Goddess,” and naturally there is great opportunity for fine scenic effects, aeroplanes and crowds which could not be shown on a stage. It is really an excellent film, splendidly acted and produced.

A very interesting and telling Russian film has been at the Scala last week called “The End of St. Petersburg.” Let us hope it will soon be released for public exhibition. Everything the Russians do in the way of art has a curious grimness and pathos, and yet at the same time they have a most tremendous sense of beauty. This film, rugged and dreadful as it is, holds one from the first moment by its sheer art of production, its beautiful lighting and sense of drama. It is the story of the awful labour conditions in St. Petersburg—the war—and then the final revolt of the workers. The types are amazingly well chosen. A film very well worth seeing.

NOTICES

NEXT WEEK

WEDNESDAY, MAY 7th, at 8 p.m. (Ordinary Meeting). S. K. RATCLIFFE, “National Parks (illustrated by lantern slides).” MAJOR-GENERAL SIR FABIAN A. G. WARE, K.C.V.O., K.B.E., C.B., C.M.G., LL.D., will preside.

FRIDAY, MAY 9th, at 4.30 p.m. (Indian Section). DAVID CLOUSTON, C.I.E., M.A., D.Sc., “The Report of the Royal Commission on Indian Agriculture” (illustrated by lantern slides). SIR JAMES MACKENNA, C.I.E., will preside. Tea will be served in the library from 4 o’clock.

REPRINT OF CANTOR LECTURES

The three Cantor Lectures on “Wind Instruments from Musical and Scientific Aspects,” by Dr. E. G. Richardson, Ph.D., D.Sc., Lecturer at University College, London, have now been reprinted in pamphlet form (price 2s. 6d.), and can be obtained from the Secretary, Royal Society of Arts, John Street, Adelphi, W.C.2.

A complete list of Cantor, Howard and other lectures, which are available in pamphlet form, can be had on application.

PROCEEDINGS OF THE SOCIETY

FIFTEENTH ORDINARY MEETING

WEDNESDAY, 5TH MARCH, 1930

SIR WILLIAM WATERS BUTLER, BT., F.C.S., in the Chair

THE CHAIRMAN said that Professor Ling was well known as one who carried out much deep and careful research work, and as an expert on all the technicalities connected with the Fermentation Industries ; and, last, but not least, was one who made a great personal sacrifice in giving up many lucrative posts in order to take the position of Director of the British School of Malting and Brewing at the University of Birmingham, where he was now giving to rising brewers the benefit of the knowledge he had gained during a life-long and wide experience in the practice and science of the Fermentation Industries.

The following paper was then read:—

BREWING AS A BRANCH OF SCIENCE

By ARTHUR R. LING, M.Sc., F.I.C.

*Professor of Malting and Brewing, and of the Biochemistry of Fermentation,
University of Birmingham*

“ Looked at from the point of view of the far-reaching nature of its principles, brewing is an industry which is capable of yielding in kind a high rate of interest on the scientific knowledge sunk in it.”

These are the words of the late Dr. Horace T. Brown, who for many years was one of the leading exponents of scientific brewing in this country as well as a world-famed biochemist. The statement is a deliberate one, arrived at as the result of fifty years' experience of the application of scientific method to brewing practice, which he dealt with in a lecture delivered to the Institute of Brewing in London in 1916. On that occasion I was privileged to occupy the chair. It appeared to me that the statement would form an appropriate text for the short address which I have the honour to submit to you.

Brewing is an industry of great antiquity, and like other industries it was at first an empirical art, its sole guidance throughout the ages being the experience handed down from generation to generation. Indeed, systematised knowledge, which we know as science, as applied to brewing, was little known 60 years ago, and even since then what passed as science has often been shrouded in superstition.

The manufacture of beer from barley is mentioned in the Westcar Papyrus now in the Museum at Berlin which was probably written in the twelfth dynasty. Quite recently an exceedingly interesting paper on the history of beer has been published by Mr. J. F. Gretton (*J. Inst. Brewing*, 1929, 356). The author quotes Dr.

Hübner, according to whose researches the Egyptians obtained their knowledge of brewing from the Babylonians who brewed beer in 7,000 B.C. From the earliest times it would appear that there was a close connection between brewing and agriculture, and Mr. Gretton points out that with the cultivation of barley and wheat, since bread and beer depend on grain and yeast for their manufacture, the bakers were in the early days also brewers. Indeed it is known that the bakers of ancient Egypt and Babylon were also brewers of beer.

But my task is not to deal with the history of brewing, but rather to show that its underlying principles belong to the sciences. Although as I have already said the application of science to brewing is comparatively recent, attempts to explain some of the phenomena connected with fermentation are to be found in early scientific writings. Of the views of the ancients on fermentation we have but few records. In Pliny's "Natural History" the fermentation of dough in bread making is supposed to be effected by a sour substance. Passing to the period of the alchemists (350-1577 A.D.) and of the iatrochemists (1577-1644 A.D.), allusions are frequently made to fermentation in writings of these quasi scientists, and it is interesting to note that the term fermentation is as a rule employed indiscriminately with the terms digestion and putrefaction, all three of which are known to be associated with the activity of those agents which we now call enzymes.

In every phase of his numerous operations the brewer finds himself closely connected with living processes—in the barley field, in the malt house, and in the brewery. The various changes occurring during the life of an organism known as metabolism are the result of the activity of those agents still denoted ferments, but now more usually referred to as enzymes. Our knowledge of these agents and of the changes which they induce has been gathered more from the work of those who have studied the fermentation industries than from any other source.

The history of fermentation in the modern sense of the term commences with the observation of Kirschhoff in 1814 that the so-called gluten of wheat flour is capable of converting starch into sugar and dextrin. Following this was the work of Payen and Persoz, who were able to isolate from barley malt the substance which we now know as diastase. Emulsin, which hydrolyses amygdalin, was isolated from bitter almonds by Liebig and Wöhler in 1837, and the first enzyme to degrade a protein was discovered by Schwann in 1836, who described pepsin of the gastric juice, whilst Corvisart pointed out the existence of another enzyme of the same class, viz. trypsin, in 1858. But the rise and development of our knowledge of fermentation can best be understood if we restrict our attention to the phenomenon of the conversion of sugar into alcohol and carbon dioxide.

We may divide the history of alcoholic fermentation into three epochs. The first is that in which chemistry was the dominant factor, the second is that in which biology held the sway, and the third is really a union of the first two and may be described as the biochemical epoch.

The chemical epoch commenced with the theory of fermentation propounded by Liebig in 1839; it had much in common with that enunciated by Stahl a

hundred years earlier. It postulated a ferment as a substance in a kinetic state capable of imparting motion to the substrate with which it was in contact, and hence decomposition of the latter ensued.

Yeast was examined under the microscope for the first time by Leeuwenhoek in 1680, who recognised its cellular structure. The biological epoch of alcoholic fermentation commenced with the work of Schwann (1836-37) who showed experimentally that the phenomenon was due to the presence of living organisms. The vitalistic theory of fermentation was however finally established by the brilliant work of Pasteur in the early 60's of the last century. It was stringently opposed by Liebig, to some extent up to the year of his death in 1873. The fact that yeast had been proved to be a living organism was to Liebig a matter of indifference: he considered its multiplication to be in no way connected with the process of fermentation. In his last paper on the subject in 1870, however, Liebig modified his theory and at the same time made considerable concessions. He now put forward the view that during the life of yeast, there is produced, in the interior of the cell, a ferment and it was to this that the phenomenon of fermentation was due. To this Pasteur replied " *Ici je ne contredirais encore pas.*" Pasteur states however that during his work he had constantly sought in vain for a ferment (enzyme) which could act independently of yeast in its living state. It was the discovery of such an enzyme by E. Buchner in 1897 that marks the biochemical epoch. Buchner, by submitting yeast to a pressure of something like 3 tons to the square inch, succeeded in expressing a liquid which was rendered free from living cells by filtration through a Pasteur-Chamberland filter. This liquid contained the active enzyme (zymase) capable of converting sugar into carbon dioxide and alcohol. Buchner's discovery thus united the chemical theory of Liebig in its latest form and the vitalistic theory of Pasteur. Buchner's observations have been confirmed by numerous other workers, and it may be said that the greatest additions to our knowledge of the subject have been made by Professor Arthur Harden and his School. The foregoing brief reference to this part of the subject is all that is possible within the limits of time and space at my disposal.

The brewer was one of the first to harness an enzyme to his service. This he did at first unwittingly, but subsequently those among his ranks such as C. O'Sullivan and Horace T. Brown studied the problem from the standpoint of pure science, and by their studies laid the foundation of our present more precise knowledge. Even at the present time the problem of the true nature of an enzyme is far from settled. So far as our knowledge extends it is a substance or mixture of substances capable of inducing a reaction by its presence without itself undergoing any change. In other words it is a catalyser analogous to those inorganic catalysers investigated by Faraday, Mitscherlich, Berzelius and others in the early years of the last century. Many active preparations of enzymes contain proteins, but cases are known of enzyme preparations which do not contain a protein, e.g. invertase of yeast. An active enzyme is invariably in the colloidal condition, and it is an amphoteric electrolite, i.e. it dissociates into positively and negatively charged ions and

thus exhibits the phenomenon of kataphoresis as shown by the work of Professor Michaelis. We owe to Professor Willstätter and his school the masterly researches embodied in some 130 papers describing attempts to purify enzyme preparations by making use of their electro-positive or electro-negative properties as first indicated by the work of Michaelis. Thus some enzymes are adsorbed by the electro-negative adsorbent, kaolin, whilst others are adsorbed by the electro-positive alumina. From the adsorbent the enzyme may be liberated by elution with dilute alkalis, phosphates, etc. Some enzymes after having been purified to some extent by the adsorption-elution process apparently change their sign. Thus crude invertase is adsorbed by alumina, but not by kaolin, but after being purified to a certain degree by adsorption-elution it is adsorbed by kaolin. Trypsin behaves in the same manner. Despite the immense amount of work carried out by Willstätter and his school, this great chemist has been forced to admit that he has not succeeded in isolating an active enzyme preparation consisting of a single chemical substance. Just as enzymes are adsorbed by certain inorganic substances, so it would seem that some sort of combination—adsorption—with the substrate precedes the reactions which they promote. Thus Emil Fischer, as a result of his studies on the isomeric methyl glucosides prepared by synthetic methods, found that the α -glucoside was hydrolysed by maltase and the β -glucoside by emulsin. He was thus led to assume that a relationship exists between the structure of enzymes and substrate, that enzymes had specific properties, and combination of enzyme and substrate precedes the final change. This view, strongly supported by the work of H. E. and E. F. Armstrong, is now generally accepted. Willstätter considers that enzymes are composed of a colloidal bearer and a specific active group, which enables them to be bound to the substrate, and the composition of which at the same time conditions the colloidal nature of the entire complex. This is tantamount to the view I have long held and expressed elsewhere on several occasions, that an active enzyme constitutes a system rather than an individual. Such a conception enables us to understand Harden's well-known discovery that zymase of yeast may be separated into two portions by ultrafiltration, both of which are inactive, unlike the parent mixture. When they are reunited activity reappears. The portion passing through the filter is called by Harden the co-enzyme. It may be boiled without losing its activating power. The colloidal portion which does not pass through the filter is the zymogen. After heating it is no longer activated by the co-enzyme. Again, according to Waldschmidt-Leitz, the trypsin of animal pancreas is incapable of acting on certain substrates unless it has been prepared from the gland that has been stored when an activator enterokynase makes its appearance. The activator is, however, in this case thermo-labile. Enterokynase is said by some to be present in the duodenum.

From what I have said it is clear that our knowledge of the chemical nature of an enzyme is still obscure. Indeed we can add but little to the views of Mitscherlich and of Berzelius that they are catalysers. Waldschmidt-Leitz has recently defined

an enzyme as a definite material catalyser of organic nature with specific powers of reaction, formed by living cells, but independent of the latter in its operation.

It is obvious that so far as our present knowledge extends the subjective study of enzymes has reached a stage at which further progress must be slow. Present day research is for the most part confined to the study of enzymes objectively, i.e. to determining the nature of the products which they give rise to when acting under definite conditions of influence on their action. I may mention time, temperature and ionic concentration, especially the concentration of hydrogen ions. I would add, however, that other cations besides hydrogen and possibly also anions besides hydroxyl may not be without influence. The remarkable influence of gypsum in the mash tun raises the concentration of hydrogen ions in the wort, but its total effect would seem to be more than can be accounted for by the increase in the concentration of hydrogen ions.

Now we cannot determine the quantity of an enzyme present in a given material, but we can determine the magnitude of the change it produces when acting on a given substrate for a definite period. Let us suppose the enzyme we are investigating is the sucrase of yeast, sometimes called invertase, and that the substrate is sucrose. The reaction which occurs is the hydrolysis of the sucrose, yielding a mixture of glucose and fructose, thus $C_{12}H_{22}O_{11} + H_2O = C_6H_{12}O_6 + C_6H_{12}O_6$. Now the water plays so small a part from the point of view of its mass that it may be ignored and the change may be regarded as a monomolecular reaction, the velocity of which may be measured by determining the products formed and applying

the equation : $-K = \frac{1}{t} \log \frac{a}{a-x}$ in which K is a constant, t the time, a the quantity of substrate at the commencement of the change, and x the quantity of substrate changed in time t . As a rule however the initial stages of the reaction are a linear function of the time. Cornelius O'Sullivan, for many years head brewer to Messrs Bass, Ratcliffe & Gretton, was one of the first to utilise this mass action method of determining the rate of hydrolysis of sucrose by sucrase. In the course of his work with Tompson (1890) he observed that the immediate effect of this change was the liberation of the two hexoses in the muta-rotating state. This observation was lost sight of for many years, with the result that when the hydrolysis of sucrose was followed by the polarimeter, subsequent observers in some cases came to the conclusion that the hydrolysis of sucrose does not obey the law of monomolecular reactions.

Cornelius O'Sullivan was not only a great chemist but he subsequently became the leading authority on practical brewing in this country. He was one of the few men who knew the value of pure science properly applied and who understood to the full the significance of the phrase "Practice with Science."

Bearing in mind the fact that starch constitutes the principal constituent of malt, it is not surprising that several of the leading scientific men connected with the brewing industry have taken up its study. The problem still awaiting solution is the structure of the starch unit, and the obvious course of attack is to ascertain the

nature and quantity of the substances formed when the complex starch molecule is broken down into simpler substances which may be assumed to be the bricks of which starch itself is built. Now we know that when starch is treated with dilute acids under appropriate conditions, it is completely converted into glucose. This fact, however, has not so much significance for the brewer as has the nature of the products resulting from the action of the amylase (diastase) of malt (which is one of the active agents operating in the mash tun) on starch.

In 1811 Vauquelin discovered that when starch is heated somewhat strongly, it is converted into a substance resembling gum arabic in its physical properties, whilst soon afterwards Kirschhoff observed that starch is converted into a crystalline sugar when it is boiled with dilute sulphuric acid, and Vogel found that in addition to sugar there is formed a gum which was named dextrin by Biot and Persoz. In 1814 Kirschhoff made the important observation that starch might be saccharified by subjecting it to the action of the vegetable albumin of grain, and that the saccharifying action of grain that had been submitted to the malting process was much more intense. Payen and Persoz in 1833 traced the saccharifying action of an infusion of malted grain to the presence of a substance which they named diastase. It had been by now well established that sugar was accompanied by the gummy substance, dextrin, when starch is submitted to the action of diastase.

So long ago as 1819 de Sausure examined the sugar resulting from the action of diastase on starch and it was more thoroughly examined by Dubrunfaut in 1847, who named it maltose. In spite of this work we find in the literature that for many years afterwards malt sugar was referred to as glucose. In fact as late as 1879 Kjeldahl fell into this error. The existence of maltose as a distinct sugar was finally established by C. O'Sullivan in 1872 and he may rightly be regarded as the rediscoverer of the sugar. O'Sullivan's further work was of great practical interest, showing as it did the influence of the mashing temperature on the nature of the products of the action of diastase on starch. The different dextrins which he isolated from the products when the reactions were allowed to proceed at different temperatures were regarded by him as non-reducing substances, although he never succeeded in isolating them quite free from reducing power. This work of O'Sullivan was of the highest practical value to the brewer, who was taught by it the importance of regulating his temperatures at different stages of the mashing process.

In 1879 Horace T. Brown commenced his memorable work at first with J. Heron, and subsequently with G. H. Morris and with J. H. Millar on the action of diastase on starch. In addition to confirming O'Sullivan's observations on the influence of temperature and expressing the results on a coordinate system, Brown and Heron showed the far-reaching effect of the reaction of the medium on the products obtained. The knowledge we now possess of the importance of maintaining the concentration of hydrogen ions at a definite value is the direct outcome of the work of Brown and Heron.

To Brown and Morris must be accorded the credit of having established the

existence of a substance of the nature of a dextrin but possessed of reducing properties, and to this substance, following Herzfeld, they gave the name malto-dextrin. Subsequent work has shown that this is only one of a series of similar substances differing in molecular weight. Brown and Morris also added to our knowledge of the chemistry and physiology of the malting process and of foliage leaves. All this work, the direct outcome of problems which practical brewing presented, formed a series of contributions to pure science of inestimable value.

In 1901 the work of the Guinness Research Laboratory was commenced under the direction of Horace Brown and in collaboration with T. B. Case and A. McMullen as administrators, J. H. Millar as chemist, and F. Escombe as botanist. The work was published in two parts (1903 and 1906) and covers 347 pages of text. It includes fourteen papers, and constitutes, apart from its value to the practical brewer, one of the most notable contributions to biochemistry and plant physiology ever made in the comparatively short space of five years. Among the refined methods of analysis herein described, mention may be made specially of the method of determining amino nitrogen by the nitrous acid method which in a form improved by Van Slyke is universally employed to-day. "Unfortunately," says Brown in his "Reminiscences," . . . "in 1906 the research laboratory, as such, ceased to exist, and the scheme which at one time promised so much for the brewing industry came to an end, partly through a mistaken idea that it had reached finality." However Brown was not idle after his connection with the Guinness Research Laboratory came to an end. Subsequently he communicated to the Institute of Brewing three valuable papers on "The Nitrogen Question in Brewing," which are also contributions to pure science no less than to applied.

To return to starch. This polysaccharide is formed in the chloroplasts of leaves where in amylogenic leaves, it is, according to Sachs, the first visible product of photosynthesis. Leaf starch has the form of extremely minutes granules—transitory starch—devoid of the organised structure of the granules present in stems and roots—true reserve starch. According to experiments carried out in my laboratories by R. G. L. Beazeley, transitory starch isolated from potato leaves is readily converted into maltose when dissolved in water and treated at 50 degrees with the diastase of ungerminated barley. Transitory starch therefore consists of what I have called elsewhere α -hexaamylose.

The granules of reserve starch, on the other hand, consist of a mixture of two, in some cases three, closely related substances. So long ago as 1716 Leeuwenhoek observed that by heating starch granules with water the hulls remained undissolved, and he found these hulls in the excreta of birds. The observations of C. Nägeli, Sachs, W. Nägeli, Brown and Heron, and A. Meyer in the 19th century all go to show that starch granules consist of more than one substance. Maquenne and Roux put forward the view that the constituent of starch granules which enables them to form a viscous paste with hot water is a substance to which they gave the name amylopectin. Mme. Gatin-Gruzewska has devised several physical methods of isolating amylopectin and others have been suggested by Ling and Nanji. Amylo-

pectin when thus isolated has the form of empty hulls. A chemical method of isolating a derivative of amylopectin has been described by Ling and Nanji. It was shown by Julian L. Baker in 1902 that when starch paste or soluble starch solution is treated with the diastase of ungerminated barley, it yields some 60 per cent. of maltose, together with a dextrin which he named α -amylopectrin. Ling and Nanji believe that this dextrin is derived from amylopectin and propose to call it $\alpha\beta$ -hexaamylose. The original amylopectin is a phosphoric ester and $\alpha\beta$ -hexaamylose is dephosphated and depolymerised amylopectin. The presence of a beta as well as an alpha bond can be shown by the behaviour of certain enzymes towards the dextrin. It is moreover the parent of the maltodextrins, of one, perhaps two, trisaccharides and of the so-called isomaltose. Maltose is also one of its hydrolytic products. The hydrolysis of $\alpha\beta$ -hexa-amylose by different enzymes is now being studied in my department.

It was shown by Ling and Davis in 1902 that when the diastase of low dried malt is allowed to act on starch paste at 55 degrees for 95 hours, the constants are $[\alpha]_D$, 138.5 degrees and R^* 96.7. The product was found to consist of crystalline maltose. Baker and Hulton have recently shown that when the diastase of ungerminated oats is allowed to act on soluble starch solutions at 50 degrees, after 24 hours the constants of the matters in solution are $[\alpha]_D$, 135.0 degrees and R 96.6. The product is shown to consist entirely of crystalline maltose. This result is extremely interesting and novel, but the conclusion of the authors that they see no way of reconciling this result with the theory put forward by Maquenne and Roux and elaborated by Ling and Nanji that the starch molecule consists of condensed amylose and amylopectin is open to discussion. Their results, they say, support the older and more simple hypothesis that starch consists of condensed maltose residues. I can only say that the evidence brought forward by Baker and Hulton is of too slender a character, and it ignores the work of Schardinger, Pringsheim, Samec, and many others. I shall have more to say on this subject when the work now in progress in my department is ready for publication.

The starch problem is one of the most controversial in biochemistry. Its apparent simplicity in reality constitutes its difficulty. The products of hydrolysis are so similar in their physical properties that their separation by fractionation with ethyl or methyl alcohol or acetone of different strengths—the only means at present available—is most unsatisfactory, and it is questionable if some of them have ever been successfully separated. In my report on the Fermentation Industries for the year 1917 (Reports on the Progress of Applied Chemistry, 1917, p.407), dealing with the maltodextrins, I remarked :—"It is probable that the whole series exists in a colloidal state, tending more towards definite chemical compounds in the lower members. The conception that these substances exist associated in a kind of solid solution is one which might explain the rule of definite relation between

* The symbol R represents the percentage of apparent maltose expressed on the total dissolved substances.

the optical and reducing properties of these hydrolytic products, on which H. T. Brown and his colleagues have so strongly insisted." I would point out, however, that this rule is only approximately accurate and then only for some starch products,

At first sight the problem of dissecting the starch molecule would appear to present a much simpler problem than that of dissecting the molecule of a protein which is probably much more complex. However, the amino acids produced by the hydrolysis of a protein are much less difficult to isolate and characterise than are the products of the hydrolysis of starch.

A great impetus was given to brewing science by the establishment of the Institute of Brewing. Its inception was due to Dr. E. R. Moritz, who in 1886 conceived the idea that it would be useful to hold meetings of brewers from time to time at which they could discuss their difficulties with one another. Accordingly a Society known as the Laboratory Club was founded. The meetings of this Club were preceded by a dinner and subsequently discussions were held and papers read, some of which were published in a journal known as the Transactions of the Laboratory Club. In 1890 the Laboratory Club having grown to an important Society, changed its name to "The Institute of Brewing," following which other Institutes of Brewing were founded in the North of England, the Midland Counties, and in Yorkshire. By degrees it was recognised that the different "Institutes" might extend their scope, and it was decided that they might become federated for the purpose of publishing a journal, in which not only should be printed original papers, but also abstracts of papers of interest to brewers published in other journals, both English and foreign. In 1895 I was appointed Editor of the new Journal, a position I held for 25 years, until I resigned it to take up my present work in the University of Birmingham. The different Institutes throughout the country were amalgamated in 1907, and since then the federated branches became sections of one body.

You will doubtless ask the question: If the manufacture of beer and all appertaining to it are so interlocked with science, why is it that special means are not provided for the training of those who have chosen to make brewing their career? My answer is that such means are provided at the present time. For many years brewing schools have existed on the continent, and about 30 years ago certain progressive members of the Institute of Brewing agitated for the establishment of a brewing school in Great Britain. The original idea was to establish a school and a research Institute under the auspices of the Institute of Brewing in London, in which those who intended entering the brewing industry could receive systematic training. In addition to this laboratories were to be provided in which brewing research could be carried out, and problems that arise from time to time in brewing practice could be solved. The suggestion divided the Institute into two camps, for certain practical brewers who had, up to that time, acted as instructors in practical brewing, under the apprenticeship system, and the consultants who had taught what passed for science, felt that their interests were being attacked. After a fierce fight lasting some considerable time

the original project remained in abeyance. It was not abandoned. In 1900 the University of Birmingham was established and obtained its Charter, and I am informed that the first sum of money towards the University fund came from the Brewing Industry of the Midlands. There have always been in the Midlands progressive brewers, and some of these led by the late Mr. Frank Wilson and others finally arranged with the University Authorities for the establishment of the British School of Malting and Brewing, which should also be a Department for the study of the biology of fermentation generally. The School was supported by subscriptions from the brewing industry and the first director appointed was the late Professor Adrian J. Brown, who until his death in 1919, trained a large number of those who now hold leading positions with brewing firms. Professor Brown both by his amiable nature and his zeal for science endeared himself to all his students. His research work, although not of so far-reaching a scope as that of his half-brother Horace, was no less sound and thorough.

Among the publications of Adrian Brown may be mentioned his discovery in 1886 that *Bacterium aceti* is able to convert mannitol into fructose, and glucose into gluconic acid. Since mannitol may be obtained from glucose by reduction, Brown's discovery was the first instance recorded of the conversion of glucose into fructose. The fact that the barley corn contains a semipermeable layer in the neighbourhood of the testa was another notable discovery made by Brown. It was of great interest to practical malting.

After the death of Professor Brown the School was endowed so that the unkeep of the Department and the emolument of the staff were rendered independent of periodical subscriptions. In April, 1920, I was appointed to the Chair.

The School has continually progressed in the direction of increasing the scope of training given to the students. An important advance was made a few years ago when the Faculty of Science suggested the establishment of an Honours' School which received the assent of the Senate and Council. Students who enter this School are required to have spent three post-matriculation years or two post-intermediate years in the Department of Chemistry and to have taken physics and botany as subsidiary subjects. They have a two years' course of lectures in my department commencing in the third year. During the two final years' work the whole time is spent in my department. In the final (fifth) year they proceed to a Diploma Course in Malting and Brewing in which geology, electrical and mechanical engineering and accounting are taken as subsidiary subjects. These subsidiary subjects are preferably spread over the last two years. The Diploma in Malting and Brewing may also be taken without the Degree. Students taking this avenue are not required to have matriculated, but must satisfy the Director that they have reached matriculation standard in English, Mathematics and Chemistry before they are accepted. Another course is that of the Certificate in Malting and Brewing. It occupies two years, one of which is spent in the Department of Chemistry and the other in the Brewing School. Neither the Diploma nor the Certificate is awarded to students until, after

leaving the University, they have completed two years' practical work in a malting or brewery.

In drawing up this ambitious scheme of education, the Faculty of Science of the University of Birmingham have been helped considerably by Sir William Butler, who as you are doubtless aware is a great educationalist and a strong advocate for the scientific training of men who are being prepared for brewing as a profession. Nor must I omit to add that the University owes to Sir William Butler a donation which rendered it possible to commence the new buildings at Edgbaston, known as the Biological Block, and comprising the following Departments: Zoology, Brewing and the Biochemistry of Fermentation, and Botany. In recognition of Sir William Butler's munificent donation towards the building of the whole block, my own Department has been named "The William Waters Butler Laboratories."

So far-reaching is the science of brewing that our students are able to command positions in other branches of the Fermentation Industries besides Malting and Brewing; e.g., Distilling, both for the production of potable and industrial alcohol, and Vinegar manufacture. In addition to these some of the students have secured positions in connection with Agriculture, Foods and Drugs, Public Health, and Sugar Manufacture. 'Three of the Honours' students occupy responsible positions connected with the Cultivation and Curing of Tea. At the present time the demand for really well-trained biochemists, even in this country, greatly exceeds the supply, whilst the requirements of the Dominions, Colonies and Dependencies in the same direction are always increasing.

The recognition that brewing is a branch of science led to discussions on how the status of the practical brewer could be improved, so that he might take his place with the members of other learned professions. Numerous suggestions were made from time to time as to how this could be brought about, and the matter culminated in the foundation by the Institute of Brewing of a scheme of examinations. The examinations are divided into two parts, Part I being a purely academic character, and Part II of a practical character. Those who have satisfied the examiners in Part I are not eligible to present themselves for Part II until they have had a subsequent five years' practical experience. Students who have obtained the Diploma in Malting and Brewing of the British School of Malting and Brewing of the University of Birmingham or of the School at Heriot-Watt College, Edinburgh, are excused Part I of the Institute's Examinations. This scheme has now been in operation for some years and it has undoubtedly achieved its objects. Successful candidates are awarded the Diploma of the Institute of Brewing which is the hall mark of the profession.

Another direction in which progress has been made in the science of brewing and its application to practice is the establishment of a research fund supported by the brewers throughout the country, who make annual contributions to it in sums assessed on the quantity of beer they brew annually. The scheme of research is now in active operation under the supervision of Mr. H. Lloyd Hind, who has been appointed organiser of research. The problems being dealt with are con-

cerned with barley and malt, with hops, with yeast and with cask timber. Barley and malt are being dealt with at Rothamsted Experimental Station from crops grown at the Experimental Farm under standard conditions. Special mention may be made of the valuable work carried out at Rothamsted by Dr. Bishop, who is working on the Proteins of Barley and Malt, and by Mr. Day. Dr. E. S. Beavan's work on barley breeding and selection occupies a premier position in regard to barley as it has led to the cultivation of many new varieties of the cereal having desirable brewing qualities. The chemical work on hops, founded on researches in Germany, has placed the brewer in possession of methods whereby the bitter and preservative principles of hops may be characterised. For this we are indebted to the researches of Drs. Pyman and Walker and no less to those of Mr. A. C. Chapman, to whose work we owe most of the knowledge we possess of the essential oil of hops. The quality of different hops from the point of view of practical brewing has also been studied by the late Mr. John M. Lones and by Mr. Lloyd Hind. One result of this work has been to show that the so-called Tolhurst hop, which is an exceedingly good cropper and therefore favourite with the grower, has a very poor brewing value, both as regards its flavouring and preservative values.

The valuable and extensive experiments on the breeding of hops, carried out by Professor Salmon at Wye Agricultural College, have resulted in the production of new varieties having desirable brewing and preservative properties, besides in some cases being immune from disease to a greater extent than are varieties commonly cultivated.

Investigations are in progress in my department on starch and other polysaccharides in barley and malt.

The object I had in view in giving you this brief address was not only to demonstrate to you that brewing is a branch of science, but also that it is one of the utmost importance to mankind in general. Apart from the fermentation industries, those remarkable agents which are the cause of all metabolic changes in life, enzymes or ferments, would certainly never have received the attention which has been given them up to the present time. We should not know as we know to-day the nature of the reactions which occur in the animal system in health and disease. Referring to brewing, Dr. Brown says in his "Reminiscences": "In its later developments it has suggested problems which in the solving have extended the boundaries of natural knowledge beyond all expectation, and have indirectly conferred incalculable benefits on the human race The real source of this knowledge is seldom comprehended even by those whose special business it is to make daily use of it in the domain of preventive medicine, modern surgery or sanitation."

Was it not the work of Pasteur on fermentation, was it not his studies on wine, beer and vinegar which taught us the aetiology of zymotic disease? "Every unhealthy change," says Pasteur, "in the quality of beer coincides with the development of microscopic germs which are alien to the pure ferment of beer." The development of this thesis and the application of the facts elucidated by the further

work of Pasteur himself, by that of Lister, of Koch and of many others has been of inestimable service in alleviating pain, suffering and disease in the human race. The extension of our knowledge in the past by the study of fermentation will, however, surely be but little compared with what we may expect in the future, for we have at present only touched the fringe of the subject. By the further prosecution of research in brewing and allied fermentation industries we may therefore expect a rich harvest of results which will be of benefit not only to the industries concerned but also to science as a whole. The number of problems awaiting solution is limitless.

DISCUSSION

THE CHAIRMAN, quoting the remark of the lecturer that his object was to demonstrate that brewing was a branch of science, and also that it was one of the utmost importance to mankind, said he thought all present would agree that he had proved that brewing was a branch of science, but he did not know why the title should speak of "a branch," for he thought they always referred to "the science of brewing." When he first took up brewing about fifty years ago, brewing was referred to as an art, though he must say that even at that time the researches of certain scientific workers, particularly at Burton-on-Trent, were just being recognised and were being applied to the daily operations of brewing. There was no doubt that the work of Pasteur was the first great move in the direction of applying science to brewing, and it brought about the use of the microscope in the brewery, which enabled brewers to examine their yeast and see if the healthy cells were mixed with disease organisms and in that way were enabled to avoid the making of an unsaleable product. But Pasteur's was not the only scientific work applied to brewing in those days, for the splendid work of Cornelius O'Sullivan brought about great changes in the brewer's methods of working.

He questioned whether there was any other industry than brewing where a knowledge of so many sciences and so much research work was necessary. What was the object of the application of science to brewing? He thought it might be said the main object was to bring about a uniform and better quality, to maintain purity, and to avoid waste of materials and manual and mechanical energy. Ignorant people, and he might say vindictive fanatics, generally said brewers applied science for the purpose of making use of cheap and unsound materials and covering up adulteration. He did not want to refer to a grand-parent as an ignorant man, but he had a grandfather who one day went into his (the Chairman's) laboratory and looking at the bottles on the shelves, said, "Willie, you don't put all these substances in beer, do you?" He had heard it said that the chairman of the company over which he himself now presided went into the laboratory at the brewery some years ago, and seeing certain bottles he swept them off the shelf, saying, "Why put these in the window?" Only a few months ago a very fine laboratory, costing many thousands of pounds, was opened at his company's brewery, and he was suddenly called upon to have removed the word "Laboratory" which had been carved in the stonework over the doorway, the reason being that "it could be seen by people riding on the tramway in front." It showed how some people regarded the application of science to brewing.

As those present knew, this view was positively repudiated by Government Department Reports and those prepared by public analysts, which showed that beer

came out with a good record from the point of view of freedom from adulterations. Thousands of samples were analysed by the authorities, mostly, he admitted, to see if brewers were truthful persons in regard to declared specific gravity, so there was not much likelihood of deleterious materials being used when so many samples were constantly going up to Government departments. Heavy taxation on the trade had added to the difficulties of the brewer by bringing about the weakening of the gravity and the alcoholic content of beer, and in maintaining the necessary hygienic conditions of the breweries, but brewers had been greatly assisted by the researches of scientists and brewery engineers.

Professor Ling had rightly referred to our great indebtedness to the pioneer workers of Burton-on-Trent. No brewer should ever forget Cornelius O'Sullivan, Horace Brown, Adrian Brown, John Heron, G. H. Morris, and Professor Henry Armstrong. They were all exceedingly glad to see Professor Armstrong with them that evening; he was a member of that early group of scientists. What was exceedingly pleasant about that work was that it was done in breweries, not in outside places. He must say he did wish that starch unit was out of the way; and that the starch chemists could solve it somehow. According to what he had read it must be eighty years since this starch unit was attacked, and it was about time it was given a rest. It took up too much of their time. The work initiated by those he had mentioned, and by others, had been augmented and confirmed, and was still being added to by living workers, many of whom he was glad to see that evening. Speaking as a brewery proprietor he wished to say that all who were in his position were greatly indebted to these workers for their self-denying labours and the free manner in which they declared to the world the results of their work.

When he was meeting his shareholders he sometimes felt they were a hungry lot, realising not fully the trouble directors were put to in earning their dividends while aiming to retain their pride in the finished article. It was said a short time ago, and he would like to assassinate the author if he knew him, that "The science of to-day is the nonsense of to-morrow." He knew of no declaration that ever gave him greater pain. He thought he heard someone in the audience say it was true; but he hoped it was not true, for such a declaration must bring discouragement to workers who wanted to advance science. He did not see that it could be true when there was the fact that the work of Pasteur, O'Sullivan and Brown was done nearly seventy years ago and still stood. If the science of to-day was the nonsense of to-morrow, then to-morrow was a long time coming. They should think of the conditions under which the work of the early workers had to be done. Practically they had to make their own apparatus. He thought Horace Brown had to make his own; he had none of the splendid apparatus that the present-day worker had at his disposal, nor such pure chemicals. Physical methods of analysis were almost unknown.

There could be no doubt about the gain that brewers obtained by applying the results of this research work to their operations, or about the necessity for the employment of scientifically trained men in the fermentation industries capable of understanding and applying the results that were being placed before brewers by scientists every day. Quite candidly he confessed that though he had done his utmost to keep pace with the outpourings of the scientific workers he had given up all hope of being able to do so. Even Professor Ling, he thought, had been nervous about mentioning one word—the word "adsorbed." He himself had looked it up in a dictionary, but it was not there. Other words, too, were difficult to find, and not being up-to-date he was puzzled when he read in Professor Ling's paper the sentence, "An active enzyme is invariably in the colloidal condition, and it is an amphoteric electrolite, i.e., it exhibits the phenomenon of katophoresis."

He, with Professor Ling, regretted that thirty years ago the Institute of Brewing was unable to set up a teaching school and research station. The University of Birmingham fortunately filled the gap, and it was interesting to know that Joseph Chamberlain gave the promoters great encouragement in their work. They were very fortunate in obtaining Adrian Brown as Director; a more lovable man, a more sincere researcher, a more inspiring tutor no one could imagine. The school was at one time carried on by Midland brewers, who each year guaranteed to make up any deficit so that fanatics could have no reason to complain to Parliament; but at the death of Adrian Brown it was thought that his splendid work ought to be commemorated, and the chair was endowed by the brewers of the country, a sum of £20,000 being obtained for the endowment of the Adrian Brown Chair of Brewing. Professor Ling followed Adrian Brown, and most worthily had he upheld the traditions of the school. As Professor Ling had said, the school afforded the fullest opportunity for any would-be brewer or brewer's chemist to obtain all the knowledge of science that was necessary in connection with the fermentation industries.

In future, he thought, all these young men would have to possess a knowledge of this science. Of course, the war and taxation had had a great effect on the school; the output of beer lessened, and a number of promising young men unfortunately fell in the war, and it had taken time to fill the gaps. But decrease in output brought about amalgamations, and there were now larger trading units, many of which were overstaffed in consequence of these amalgamations, and unfortunately there was unemployment in some directions. He thought the ultimate result would be that all future vacancies would be filled by men learned not only in the practice and art of the brewer but also in the science of brewing, making the vocation truly a profession.

No one could say that opportunities were not afforded now for obtaining knowledge of these sciences. When he began about forty-eight years ago no textbook on brewing existed, he believed. The first he knew of was the one by Grant Hooper, and then Henry Stopes—whose daughter, Dr. Marie Stopes, he was delighted to see among the audience—wrote a fine book on malting, which had been of great service to him. There was a translation of Pasteur's work, which was useful, a book by Southby, and a translation of Thausing's work. As appealing to the younger members of the audience he would add that in his early youth he became a member of most of the societies. He joined the Chemical Society, the Society of Arts, of which he had been a member for forty years, the Society of Chemical Industry, and he was one of the original members of the Laboratory Club, and so on. It was of great assistance to join many of these eminent societies as early as possible.

To the Royal Society of Arts they were deeply indebted for their meeting that evening. To it they owed the series of Cantor lectures on brewing by Dr. Graham and on yeast by Salamon, and the lecture delivered by Mr. Chaston Chapman on "Micro-organisms and some of their industrial uses." That evening they had had the pleasure of hearing Professor Ling give in a condensed form the history of the science of brewing and pleading that young men who intended to take up positions in breweries should undergo training in the School of Brewing at the University of Birmingham or at the Heriot-Watt College at Edinburgh. There were also evening classes at the Sir John Cass Institute. All students should finally sit for the Diploma examination of the Institute of Brewing.

It had been suggested by some of the scientists present that in the discussion the views of the brewers should be taken first, so he would ask Mr. Field, as one of the senior brewers in the room, to address the meeting.

MR. H. E. FIELD (Past President, Institute of Brewing) told how, when he started brewing, he paid a handsome fee to be taught the practical art, but for the first year

he did not see a microscope, and in other respects the opportunities for learning fell far short of those of the present day. When he realised how science had come into the industry and how industry had advanced through its aid in the past fifty years he felt that brewers ought to be very grateful to the men of science who had come in to teach them their business. He was glad to think that the practical brewer was not above learning and was doing his utmost to acquire scientific knowledge. There was no industry nowadays that could be successfully carried on without the aid of science. Of course, science was not everything; speaking from the practical side, as one who had spent a lifetime in brewing, he was not going to say science was first and last and the only thing, for there were many other faculties which every practical brewer must have. Commonsense and experience both played large parts. He remembered hearing about an applicant for the position of brewer, and he was asked, "Have you had any trouble in your breweries, Mr. Smith?" He replied, "Oh, no, not at all," whereupon he was told, "You are not the man we want." The brewer in many cases had to have a knowledge of the management of men, and above all things he must be a student of human nature. But the brewer of to-day was doing his best to avail himself of scientific knowledge as it came to hand, and in the days to come it would be found that he had not disgraced science.

MR. R. J. B. STOREY (Past President, Institute of Brewing) agreed that science was not thought of very highly by those engaged in brewing thirty-five or forty years ago, but to-day they would all agree that it had been a great help to them, and although Professor Ling had said that the Institute of Brewing Research Scheme was helped by ample contributions from the brewing trade he himself contended that the science of the brewing trade would greatly benefit if those contributions were much more than at present. He thought the lecturer had suggested that science rang the deathknell of Tolhurst hops, but he could not agree with this, for he believed most brewers had decided years ago that they were useless. Many growers sacrificed everything for a large crop, and the result was that the crop outgrew the market.

MR. ROBERT V. REID (Past President, Institute of Brewing) remarked that he and other maltsters would be prepared to say they had more time to spend in science than the brewer could have, for the maltster's manufacture went into the hands of a few, whereas that of the brewer went into the hands—he hoped—of every man and woman who walked the country. It seemed to him as he grew older in the malting profession that the entire manufacture of the maltsters, from the selection of the raw material to the delivery of the malt to the buyer, was bound up in science and research from start to finish. He had followed with great interest the advance made in this country in the direction of combining science and the management of commerce. It was some years since he was President of the Institute of Brewing, but he still looked back with pleasure to the time when he made his first appearance and took as his first theme, "The Friendship of Science." As the years went by he acknowledged that friendship more and more wholeheartedly. It was very noticeable to-day. The leading journals as well as the popular ones now published columns and half-columns on scientific subjects because these were of interest to the general reading public, and in that day's issue of "The Times" there were quite a number of articles on scientific matters, in leading positions, three of them being most important contributions on the science of commercial business, the subject which was before them that evening. He thought there could be no question of the correctness of the view of some of our foreign neighbours, that we are lacking in not being quicker off the mark. When he was President of the Institute of Brewing

his experience showed him that brewers were far too late in laying an organisation, but he dreamed then, as many others did, their Chairman that evening being a most enthusiastic dreamer, of a central research station for the Brewing and Fermentation Industries, which would benefit not only their own industry and science in general but mankind, for Professor Ling had shown what an extension of scientific research in this field must mean for the general welfare. The laying of the foundation stone of that central research station was long overdue, and he wished to back up what Mr. Story had said and suggest that perhaps the funds had been coming in too slowly.

PROFESSOR H. E. ARMSTRONG, F.R.S., said he looked upon that meeting as an occasion, for it was long since the aforetime beverage of heroes had come before the Society. He was happy that evening because the paper was by one who was an early product of the evening class Finsbury Technical College system and his pupil in 1883-4, also because Sir William Butler was in the chair, giving them the opportunity to recognise and thank him publicly for the great work he had done for education, especially in connection with biological science.

He had himself always been the friend of beer and he would worship it to-day if what he could get were worthy to be called beer. He thought beer might be taken as a measure of civilisation. It was a beverage, not an alcoholic drink; it was not to be judged in terms of alcohol. Germany had always been to the fore as a nation of brewers. The use of beer, popularised by Pasteur in France, had spread to all the wine-making countries and was generally regarded as a sober source of sociability, Spain, in particular, standing high in his scale. He wondered why English people should be prevented from having that social intercourse over beer which people on the Continent were able to get.

Like nearly all papers, Professor Ling's paper had not been written with sufficient care. English people would insist on mixing up tongues in their talk. Put "Brewing as a Branch of Science" into English and what did it mean? Everyone at once could attach honest meaning to two of the nouns; the third was unknown. It was the password of a mysterious cult. Actually, Science was the Latin for Knowledge. A science was simply a coherent body of knowledge—nothing more, nothing less. Professor Ling had attempted to show what they understood of brewing; what he had shown was not their science but their nescience, their ignorance.

Brewing was one of the finest of the Arts, not a branch or body of knowledge. Brewers were artists, not to be reduced to the level of a Ford—all bent upon turning out a standard product, the parts renewable at will.

His old friend Horace Brown, whose words were quoted at the head of the paper, slipped badly in using the expression, "Scientific Knowledge." The adjective was redundant and when it was omitted ordinary people saw what was meant. 'The man in the street, seeing the word "Scientific," thought there was some mumbo jumbo in the background; and it was to the advantage of all to avoid this impression.

To call Horace Brown a bit of a chemist was an abuse of words. He was a whole chemist in feeling and everything else besides: astronomer, botanist, geologist, physicist, physiologist and artist. Whole chemists were needed for the service of brewing if its mysteries were ever to be understood; but as in agriculture, so in brewing—they had not a man fit for the adventure. It was useless to tinker with the problems that the industry offered for solution.

What Professor Ling meant when he spoke of Brewing as a Branch of Science was that if it was to be understood there was a very great deal to learn. How much

of this knowledge was necessary to the brewer and how was he to obtain it? There was nothing he would deprecate more than the special training in a special school which the lecturer advocated. Brewing must remain an art, as it was an industry using vital products as raw materials, subjecting these to vital processes and making a product to minister to vital needs. A man trained only to think in terms of hydrogen ion concentration and all the subtle assumptions of the colloid frothblower had all sense of artistry crushed out of him. It was this kind of creature that had ruined beer. He might be put up with in the laboratory but he was a danger in the beer-house.

The art was based upon experience alone up to about the 60's of last century, when the product was magnificent. Horace Brown, who had introduced him to its temple in 1865, was one of the early disturbers of the peace. Brewers began to work with understanding; using the jargon of the cult, a scientific trend was given to the industry.

Pasteur and Horace Brown, with Lister in the background, explained yeast and for the first time put real meaning into the word "cleanliness." O'Sullivan explained the mashing process. Nothing else that had been done really counted in brewing. As of old, the brewer's business was to malt and to mash satisfactorily and economically, then to ferment the wort into beer. Thermometer and tongue were still his best guides. The analyst might aid and check his judgment but was not necessary.

The discovery that cleanliness was the highest virtue in brewing was of value in two ways. It became possible to insure the production of a beer that not only did not go sour at once but remained sweet a reasonable time. It also became possible to brew all the year round, so that a great saving of capital was effected but beer suffered greatly. No longer stored, there was no time for a secondary fermentation and consequently distinctive flavour remained undeveloped. It was on this account that pure yeast never gained a hold in practice in this country.

Burton-on-Trent was a tragedy to-day, sacrificed to misapplied science and soulless directorates; the traveller could no longer recognise its beers, so lost was their individuality. Export Guinness was not open to this criticism but it was the one link left with the past. He desired to see brewing once more looked upon as an art of high distinction and individuality, not from the Limited Liability and great combine point of view. He would abolish from it the word "Science" and all spurious "Research," all mystifying talk of hydrogen ions and put in their place really honest, commonsense knowledge and full admission of ignorance.

The interesting things that Professor Ling had told them must be known by way of insurance and control but they had little to do with practical brewing. The truly pitiable story of starch showed that after sixty years' hard labour they knew practically nothing; it was not yet a defined substance! It was comforting to realise that the best beer had been made when actually nothing was known about starch. The fact was that these problems were very difficult to solve; only real chemists could solve them and their solution involved an immensity of what must always be costly labour. The immediate work of the future would be to secure a proper system of training at the Universities, one that would bring to life a class of men competent to deal with vital problems. They did not at present exist. Meanwhile, a broad standard for beer had to be established; without it all "brewing research" must be of slight worth. He believed the present scheme to be sheer waste of money—it was not scientific in any particular, because it was not purposive; it could not be, because there was as yet no standard of purpose. It was little more than an expression of goodwill, a well-meant effort with no clear conception of the

duty behind it. He was sure the agricultural work was valueless, because they could not sufficiently assess the value of grain; moreover, there was more than enough barley in the world for their use. He doubted the value of most of the work on hops, again because they had as yet no proper means of correlating quality with brewery requirements. The rest of the work met no clear, positive need.

Brewers should reconsider their position very carefully. The Guinness Brewery, which he had studied, seemed to afford a model which could be followed with safety. The work of scientific inquiry must ever be connected with practice and the materials and processes considered and correlated into a connected whole; therefore, the scientific department must be directly attached to a brewery of importance.

He had long insisted upon the value of the brewing industry to the public, not only to the publican. Most of the ills that man was heir to and not man only but all animals of domestic concern, were due to bacteria, members of the yeast tribe. The single cell was the origin of all life. The results of a profound study of the habits of yeast could not be otherwise than of consequence, not only to brewing but also to medicine, to agriculture and to a rational understanding of animal nutrition.

In such an establishment as he had suggested, given competent leadership, clearly visualised tasks and workers properly schooled in the practice of using knowledge with effect—the scientific method—much would be accomplished. The purpose of the industry would not be secured unless and until these conditions were fulfilled. Meanwhile, if counsel were wisely taken, a beginning might be made and much present waste avoided.

MR. CHASTON CHAPMAN, F.R.S., congratulated Professor Ling on the interesting contribution he had made to the Society. Professor Armstrong had said much that was true in his own forceful way, and also a little that was rather provocative, though once or twice there was a suspicion that he had his tongue in his cheek. As the hour was late he would not rise to this provocation. The occasion was obviously not one for the discussion of details and he would speak only in general terms. Objection had been taken to Professor Ling's expression "a branch of science," but there could, he thought, be no real objection to it. After all had been said science was merely systematised and co-ordinated knowledge, and although it was true in a certain sense that science was synonymous with knowledge, it must be remembered that a man might possess much knowledge, but that this would not be of any use for a particular purpose if it were not systematised: that was, it seemed to him, a clear practical distinction. As there was a vast collection of systematised and co-ordinated knowledge in connection with brewing Professor Ling had not, he thought, gone too far in the title he had taken for his Address. It was interesting to note—and here he was in agreement with Professor Armstrong—that there was also a certain amount of art. That was one of the highest compliments that could be paid to any industry. Although it was true that enormous advances had been made in their knowledge of the scientific principles underlying the brewing processes, it was interesting to note that the essential practice had not been greatly changed over a long period of years. If, in fact, a brewer of a century ago were to find himself to-day in a small country brewery he would almost certainly recognise his surroundings. He would recognise the mash-tun, the cooler—if there happened to be one—the fermenting vessels and the casks, but if he happened to be confronted with a modern bottling machine or a pure air plant he might certainly feel somewhat perturbed. It was undoubtedly true that in the application of scientific principles great changes had been made in the past fifty years. Not very many years ago it was only possible to brew beer at certain times of the year, and if a brewer of those

days had been asked to produce a sound beer such as was in demand to-day he would have declared it to be impossible. It had been made possible by science. Professor Ling had rightly emphasised the fact that the great development in the science of brewing had taken place only in comparatively recent years. And was that not what one would have expected? There was no other industry so far as he (the speaker) knew which presented so many complex and difficult problems. There was, in the first place, the main raw material of the brewer, the starch. This represented a chemical problem of extreme difficulty, and it was certainly not the fault of scientific workers that we had not as yet arrived at a final solution. This subject alone was, in fact, sufficient to occupy the attention of very highly-trained chemists for probably a good many years to come. Then there was the question of the proteins which represented perhaps one of the most difficult chapters in chemical science, and which were of such importance in connection with the brewing process. Then, to take hops, the chemistry of which was again of an exceedingly complex character. The separation of the various constituents of the resins was a matter of great difficulty. The oil was a highly complex product, and the separation and study of the preservative properties represented an enormous amount of difficult work. Then they had the enzymes, of the nature of which very little was even yet definitely known, and as if all this were not sufficient, the scientific worker was confronted with the element of life which produced complications all along the line. Was it therefore surprising that they had not made greater progress? What seemed really astonishing was that so much had been learned in such a comparatively brief space of time. He felt that he disagreed somewhat with Professor Ling's remark that the science of brewing was practically unknown 60 years ago, for it was just upon 60 years since his old chief, Professor Graham, delivered his well-known course of lectures on this subject in the very room in which they were meeting that evening. That course of lectures marked the beginning of the scientific advance, for it was only then that the brewers began to pay serious attention to the scientific control of their industry. Graham never made any serious discovery, but he was a great man in many ways and he certainly pointed the way to the development of science as applied to brewing. It was difficult at the present time to realise what an enormous influence those lectures of Graham had for many years after they had been delivered. Although he (the speaker) had always been and still remained a confirmed individualist he believed that the time had come when a combined and organised effort was necessary for the solution of some of the problems with which they were confronted. In this connection the Institute of Brewing was to be congratulated on the Research Scheme which it had evolved and which he believed would, in time, achieve valuable results. The brewing industry also owed a great debt of gratitude to Sir William Butler for his generosity and public spirit.

PROFESSOR LING, replying to the discussion, referred to Mr. Field's remark about the many-sidedness of brewing and his suggestion that the brewer had more than science to learn. At Birmingham University, he said, no endeavour was made to teach practical brewing, but the scientific principles of brewing, so that when the student went into the brewery his eyes would be open wider than those of the man who had not had the training, because of his practical knowledge of those principles. At the same time the practical objective was always kept in mind in teaching the principles. He agreed with Mr. Chaston Chapman that science was not bare knowledge but systematised and co-ordinated knowledge. Some knowledge might be merely empirical. Mr. Strong had said it was incorrect to attribute the extinction of Tolhurst hops to science; but he thought he had said that both the scientist and

the brewer had had a share in that. Professor Armstrong, to whom he owed much, thought he had sullied the memory of Horace Brown by calling him "a bit of a chemist," meaning presumably a bio-chemist; but he (the lecturer) did think it was necessary to divide chemistry into sections, and when he looked at the work being done by the so-called bio-chemist he thought the term was justified. The Professor had spoken about pure yeast as one of the factors of pure beer. He (the lecturer) regarded brewery yeast as a product of its environment; it was a whole cosmos of cells performing different functions. That was how the secondary yeast producing the secondary fermentation was obtained.

On the proposition of the Chairman a vote of thanks to the lecturer having been passed unanimously, the meeting then terminated.

NOTES ON BOOKS

PHOTO-PROCESSES IN GASEOUS AND LIQUID SYSTEMS. By R. O. Griffith, D.Sc., and A. McKeown, D.Sc., Lecturers in Physical Chemistry in the University of Liverpool. London: Longmans, Green and Co., Ltd. 25s. net.

This outstanding treatise constitutes a remarkably valuable contribution to the study of Photochemistry, and will be examined with great interest by every worker in this obscure and difficult field. It is, moreover, of wider application than might be gathered from its title, since the authors have rightly felt that any isolated attempt to describe adequately the present position of this subject would necessarily presume a degree of familiarity with certain recent physical developments, such as few readers could be expected to possess.

It thus comes about that the first half of the book is not specifically photochemical, but deals in a general manner with the relations between radiation and matter; and it may be doubted whether any more lucid account of this comparatively recent branch of knowledge is in existence. The subjects here treated are the nature of radiation, the quantum theory, atomic structure, emission and absorption spectra, fluorescence and chemiluminescence.

In the purely photochemical half of the book, after an exhaustive general description of the phenomena, discussion mainly centres on the application of Einstein's Law of Photochemical Equivalence to gaseous and liquid systems. A special chapter is devoted to the important reactions of chlorine with hydrogen and carbon monoxide respectively; another to "photosensitisation"—*i.e.*, the phenomenon which occurs when a substance absorbs activating light and, without itself suffering permanent change, "permits the absorbed energy to be utilised in initiating chemical reaction between other molecular entities present;" and a final chapter to photochemical catalysis and inhibition, together with the effects of such conditions as solvent, temperature, etc.

The confinement of the discussion to gaseous and liquid systems will be regretted by some, since it "eliminates the important subjects of photosynthesis of carbohydrates and the action of light on photographic plates"; but the authors have considered that "adequate treatment of these matters would require that more attention be devoted to the non-photochemical aspects of these phenomena than to the photochemical."

THE LIBRARY

The following books have been presented to the Library since the last announcement :—

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- Coombs, William H. The Nation's Key Men. London : J. D. Potter.
- Dawe, Edward A. Paper and Its Uses. Two Vols. London : Crosby Lockwood & Son. 1929.
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- Durrans, Thos. H., D.Sc. Solvents. London : Chapman & Hall, Ltd. 1930.
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- Jeans, Sir James. M.A., D.Sc., LL.D., F.R.S. The Universe Around Us. Cambridge University Press. 1929.
- Knights, Charles C. and Frank E. Norman. Commercial Art Practice. Second Edition. London : Crosby Lockwood & Son. 1930.
- Knowles, L. C. A., M.A., LL.M., Litt. D. and C. M. Knowles, LL.B. The Economic Development of the British Overseas Empire. Vol. 2. Comparative View of Dominion Problems Canada. London : George Routledge & Sons, Ltd. 1930.
- McKinley, Captain Ashley C. Applied Aerial Photography. London : Chapman & Hall, Ltd. 1929.
- Maurois, André. Byron. Translated from the French by Hamish Miles. London : Jonathan Cape. 1930.
- Maxwell, Donald. A Detective in Kent. London : John Lane, The Bodley Head, Ltd. 1929.

- Mellor, J. W., D.Sc., F.R.S. 1. Intermediate Inorganic Chemistry. 2. Elementary Inorganic Chemistry. London: Longmans, Green & Co. 1930.
- Meynell, Francis. The Typography of Newspaper Advertisements. London: Ernest Benn, Ltd. 1929.
- Miers, Sir Henry A., M.A., D.Sc., F.R.S. Mineralogy. Second Edition. London: Macmillan & Co., Ltd. 1929.
- Niyogi, J. P., M.A., B.L. The Evolution of the Indian Income Tax. London: P. S. King & Son, Ltd. 1929.
- Oliver, Basil, F.R.I.B.A. The Cottages of England. London: B. T. Batsford, Ltd. 1929.
- Pirsson, Prof. Louis V. and Prof. Charles Schuchert. A Text-Book of Geology. Part I. Physical Geology. Third Edition. London: Chapman & Hall, Ltd. 1929.
- Quennell, Marjorie and C. H. B. Everyday Things in Homeric Greece. London: B. T. Batsford, Ltd. 1929.
- Read, Herbert. Staffordshire Pottery Figures. London: Duckworth. 1929.
- Richardson, E. G., B.A., D.Sc., Ph.D. The Acoustics of Orchestral Instruments and of the Organ. London: Edward Arnold & Co. 1929.
- Roberts, S. C. An Eighteenth-Century Gentleman and other Essays. Cambridge University Press. 1930.
- Robertson, Prof. John Kellock. Introduction to Physical Optics. London: Chapman & Hall, Ltd. 1930.
- Robinson, Ralph M. Coutts'—The History of a Banking House. London: John Murray. 1929.
- Robson, Philip A., F.R.I.B.A. Architecture as a Career. London: B. T. Batsford, Ltd. 1929.
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- Salwey, Jasper, A.R.I.B.A. The Art and Practice of Sketching. London: B. T. Batsford, Ltd. 1930.
- Smith, J. W., B.Sc., Ph.D. The Effects of Moisture on Chemical and Physical Changes. London: Longmans, Green & Co. 1929.
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- Stratton, Arthur, F.S.A., F.R.I.B.A. The Styles of English Architecture. Part II—Tudor and Renaissance. London: B. T. Batsford, Ltd.
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- Wall, E. J., F.C.S. Photographic Emulsions. London: Chapman & Hall, Ltd. 1929.
- Warland, E. G. Modern Practical Masonry. London: B. T. Batsford, Ltd. 1930.
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GENERAL NOTE

THE ROYAL SANITARY INSTITUTE.—HENRY SAXON SNELL PRIZE.—The Henry Saxon Snell Prize was founded to encourage improvements in the construction or adaptation of sanitary appliances, and is to be awarded by the Council of The Royal Sanitary Institute at intervals of three years. The Prize in the year 1930 will consist of Fifty Guineas and the Medal of the Institute, and is offered for an Essay, of not more than 5,000 words and illustrated by drawings or sketches, on "Improvements in the Sanitary Provisions of Schools." Essays must be submitted not later than 30th August, 1930. Full particulars regarding the Competition can be obtained from the Secretary, Royal Sanitary Institute, 90, Buckingham Palace Road, London, S.W.1.

MEETINGS OF OTHER SOCIETIES DURING THE ENSUING WEEK.

MONDAY, MAY 5. Engineers' Society of, at Burlington House, W. 6 p.m. Mr. H. R. Lintern, "The Methods of Testing the Lubricating Values of Oils, Greases, etc." Geographical Society, at the Aeolian Hall, New Bond Street, W. 8.30 p.m. Major R. W. G. Hingston, "The Oxford Expedition to British Guiana." Surveyors' Institution, 12 Great George Street, S.W. 8 p.m.

University of London, at King's College, Strand, W.C. 5 p.m. Capt. C. Thorpe, "The Defence of the Civil Population in Future Wars."

At King's College, Strand, W.C. 5.30 p.m. Prof. Dr. K. Budde, "Pictures of the Great Prophets from Amos to Jeremiah." (Lecture I).

At University College, Gower Street, W.C. 5.30 p.m. Prof. J. Macinurray, "Philosophical Approach to Modern Problems."

TUESDAY, MAY 6. Anthropological Institute, 52 Upper Bedford Place, W.C. 8.30 p.m. Major Trevor, "Great Zimbabwe."

Civil Engineers' Institution of, Great George Street, S.W. 6 p.m. Prof. R. V. Southwell, F.R.S., "Aeronautical Progress, 1911-1930." (James Forrest Lecture).

Iron and Steel Institute, at the Chamber of Commerce, 95 New Street, Birmingham, 7 p.m. (1) Mr. J. A. Jones, "Chromium-Copper Structural Steels." (2)

Mr. M. L. Becker, "Carburising and Graphitising Reactions between Iron-Carbon Alloys, Carbon Monoxide and Carbon Dioxide." (3) Messrs. A. L. Norbury and E. Morgan, "The Effect of Melting Conditions of the Microstructure and Mechanical Strength of Grey Cast Irons containing various amounts of Carbon and Silicon." (4) Mr. R. Whitfield, "Single-Sheet or Thin-Pack Normalising or Heat Treatment versus Box-Annealing of Sheets."

Photographic Society, 35 Russell Square, W.C. 7 p.m. Mr. J. A. Hall, "Some Problems of the Printing Process."

Television Society, at University College, Gower Street, W.C. 8 p.m. Mr. R. Neville-Gray, "Liquid Photo-Electric Cells."

University of London, at the Imperial College of Science, Imperial Institute Road, S.W. 5.30 p.m. M. le Professeur L. de Broglie, "Les Nouvelles Conceptions Physiques Introduites par le Développement de la Mécanique Ondulatoire." (Lecture I).

Zoological Society, Regent's Park, N.W. 5.30 p.m. Scientific Business Meeting.

WEDNESDAY, MAY 7. Analysts' Society of Public, at Burlington House, W. 8 p.m. (1) Messrs. L. H. Lampitt, E. B. Hughes, and H. S. Rooke, "The Diastatic Activity of Honey." (2) Dr. W. R. Schoeller, "A New Method for the Separation of Titanium from Zirconium and Hafnium." (3) Messrs. E. R. Bolton and K. A. Williams, "The Composition and Polymerisation of Chinese Wood (Tung) Oil."

British Academy, Burlington Gardens, W. 5 p.m. Professor Lascelles Abercrombie, "A Plea for the Liberty of Interpreting." (Annual Shakespeare Lecture).

Dunford House Cobden Memorial Association, at the Royal Society of Arts, Adelphi, W.C. 5 p.m. President Nicholas Murray Butler (of Columbia University, New York), "Nation Building—and Beyond." (Richard Cobden Lecture).

Literature, Royal Society of, 2 Bloomsbury Square, W.C. Professorial Lecture, 5.15 p.m.

Mechanical Engineers' Institution of, at the Hotel Metropole, Leeds. Annual Meeting of Graduates' Section. Mr. H. R. M. Thorp, "Alignment Charts as an Aid to Control of Stocks."

Metals, Institute of, at the Institution of Mechanical Engineers, Storey's Gate, S.W. 8 p.m. Major F. A. Freeth, D.Sc., F.R.S., "The Influence of Technique on Research." (Annual May Lecture).

University of London, at the Imperial College of Science, Imperial Institute Road, S.W. 5.30 p.m. M. le Professeur L. de Broglie, "Les Nouvelles Conceptions

Physiques Introduites par le Développement de la Mécanique Ondulatoire." (Lecture II).

At King's College, Strand, W.C. 5 p.m. Prof. J. A. Gunn, "Pharmacological Reactions of Involuntary Muscle." (Lecture I).

At King's College, Strand, W.C. 5.30 p.m. Prof. Dr. K. Budde, "Pictures of the Great Prophets from Amos to Jeremiah." (Lecture II).

At the London School of Economics, Houghton Street, W.C. 5 p.m. Dr. A. D. McNair, "The Functions and Differing Legal Character of International Treaties."

At University College, Gower Street, W.C. 5.30 p.m. Prof. F. J. Cole, "The Early History of Generation and Comparative Anatomy." (Lecture I).

THURSDAY, MAY 8. Auctioneers' and Estate Agents' Institute, 29 Lincoln's Inn Fields, W.C. 3 p.m. Annual General Meeting.

Chemical Society, at the Salters' Hall, St. Swithins Lane, E.C. 5.30 p.m. Prof. Dr. Niels Bohr, "Chemistry and the Quantum Theory." (Faraday Lecture).

Historical Society, 22 Russell Square, W.C. 5 p.m. Miss Irene A. Wright, "The Spanish Resistance to the English Occupation of Jamaica (1655-1660)."

Oil and Colour Chemists' Association, at 30 Russell Square, W.C. 7.15 p.m. Annual General Meeting. Mr. A. W. C. Harrison, "Some Technical Methods of preparing Wood Oil for use in Paints and Varnishes."

Photographic Society, 35 Russell Square, W.C. 7 p.m. Mr. L. D. Talamon, "Hypersensitization of Colour Plates."

University of London, at the Imperial College of Science, Imperial Institute Road, S.W. 5.30 p.m. M. le Professeur L. de Broglie, "Les Nouvelles Conceptions Physiques Introduites par le Développement de la Mécanique Ondulatoire." (Lecture II).

At King's College, Strand, W.C. 5 p.m. Prof. J. A. Gunn, "Pharmacological Reactions of Involuntary Muscle." (Lecture II).

At King's College, Strand, W.C. 5.30 p.m. Prof. Dr. K. Budde, "Pictures of the Great Prophets from Amos to Jeremiah." (Lecture III).

At King's College, Strand, W.C. 5.30 p.m. Mr. I. L. Evans, "The Economic Development of Modern Roumania (1829-1929)." (Lecture II).

At King's College, Strand, W.C. 5.30 p.m. The Right Rev. J. White, "Reunion and International Friendship."

At the London School of Economics, Houghton Street, W.C. 5 p.m. Prof. P. Vaucher, "The Civil Service in France."

At University College, Gower Street, W.C. 5.30 p.m. Prof. F. J. Cole, "The Early History of Generation and Comparative Anatomy." (Lecture II).

At University College, Gower Street, W.C. 5.30 p.m. Prof. E. G. Gardner, "Dante and Italian Art."

FRIDAY, MAY 9. Astronomical Society, Burlington House, W. 5 p.m.

Chemical Industry, Society of (Chemical Engineering Group), at the Criterion Restaurant, Piccadilly Circus, W. 6 p.m. Annual General Meeting. Mr. Howard A. Young, "The Effect of Filter Aids on Industrial Development."

Malacological Society, at University College, Gower Street, W.C. 6 p.m.

Physical Society, at the Imperial College of Science, South Kensington, S.W. 5 p.m. 1. Mr. E. J. Williams, "The Inductance of Electromotive Forces in a Moving Liquid by a Magnetic Field; and their application to the Investigation of the Flow of Liquids." 2. Mr. E. J. Williams, "The Motion of a Liquid in an Enclosed Space." 3. Mr. E. Simeon, "The Generation of Sound by the Siren Principle." A demonstration of the regional absorption of dyes by crystals of alum and Rochelle salt will be given by Dr. A. G. Milligan.

University of London, at King's College, Strand, W.C. 5 p.m. Prof. J. A. Gunn, "Pharmacological Reactions of Involuntary Muscle." (Lecture III).

At King's College, Strand, W.C. 5.30 p.m. Prof. Dr. K. Budde, "Pictures of the Great Prophets from Amos to Jeremiah." (Lecture IV).

At University College, Gower Street, W.C. 5.30 p.m. Prof. J. H. Morgan, "The Legal and Political Unity of the Empire." (Lecture I).

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FRIDAY, MAY 9th, 1930

VOL. LXXVIII

All Communications for the Society should be addressed to the Secretary, John Street, Adelphi, W.C.2.

NEWS OF THE WEEK

"At the risk of seeming fantastic, I will venture to say that the final objective of the New Education is a gradual transformation of the industry of the world into the universality of the world; in other words, the gradual bringing about of a state of things in which "breadwinning" and "soul-saving" instead of being as now, disconnected and often opposed operations, shall become a single and continuous operation."

Lawrence Pearsall Jacks.

The Cotswolds.—The Hon. Stafford Cripps, K.C., who is a distinguished Fellow of the Society, has invited all those interested in the preservation of the Cotswolds to meet Mr. Arthur Greenwood, the Minister of Health, when he visits his village of Filkins to inspect the four cottages which he has built for the Witney Urban District Council with his own local stone wall and stone tiles. Full particulars of these cottages were given in Mr. Robertson Scott's little quarterly, *The Countryman*. We hope to give an account of this meeting in next week's issue. The result of Mr. Cripps' effort should be that no more unpleasant cottages should be built at least in the Witney district, and the sixteen cottages, now proposed to be built at Burford, will at least be in the vernacular manner and of the right materials. Sixteen cottages can obviously be built at a much cheaper rate than four, if the work is properly standardised, and the labour organised efficiently. Visitors to Filkins will be interested to recollect that they are close to the home of William Morris, Kelmscott Manor, Lechlade, the Founder of the Society for the Protection of Ancient Buildings, the man who did more, probably, than any other to revive a living interest in the crafts and the art of building rightly.

West Wycombe.—The general work of reparation in this village is being held up pending the laying of the necessary drains. The Ministry of Health are alive to the importance of this, and we have received the following letter on the subject from the Treasury, dated 30th April:—

"You will be glad to hear that as the result of a meeting on the 24th at the Ministry of Health between the Wycombe Rural District Council and the Chipping Wycombe Borough, there is some possibility of a reasonably early agreement between these bodies for the laying of the sewer which will connect the West Wycombe sewers with the Borough system. We will keep an eye on the developments to hasten them if we can."

Descriptive Walks and Inns.—Mr. S. J. B. Mais continues his descriptive walks in the *Daily Telegraph*. They are refreshingly observant of nature, men and things. He at least has found one Inn where the freshest butter and cheese can be obtained, and rightly observes, as he descends into Guildford, that the loveliest thing in Guildford, is not the Castle nor the "Lion," where Pepys stayed, and John Peel's Hunting Horn now rests, but the red brick Abbott's Hospital. How satisfying are the shapely manner and materials of this delightful quadrangular group opening now on the restless manners of the High Street.

Buckinghamshire.—We read the following in *The Times* with great interest :—

THE PRESERVATION OF BUCKS.

It has long been desired to establish a branch of the Council for the Preservation of Rural England in Buckinghamshire, and this is now on the eve of fulfilment. An inaugural meeting is to be held at the Walton Parish Hall, Walton Street, Aylesbury, on Saturday, at 3 p.m.

The boundaries of the branch shall be identical with those of the county, other than the area covered by the Thames Valley branch. It will organise concerted action for the protection and preservation from disfigurement or injury of rural scenery or features of local interest, and of the towns and villages within its area, and with that end in view will promote co-operation between local authorities, town and regional planning committees, local and other societies, land-owners and all other persons interested. It will also act as a county and local centre for giving or obtaining advice and information on all matters affecting the preservation of amenities.

Membership is open to land and property owners, permanent residents, and other private individuals.

Here is a splendid opportunity for the C.P.R.E. to co-operate with the Royal Society of Arts and expedite the completion of their work in West Wycombe. The Guest House there might radiate the gospel of educated control which is the real doctrine of both Societies.

There is much work to be done in Aylesbury and the district round, and it is good news that such lovely country is to have additional assistance.

Ewell.—We are still without all the data to form any really considered views on the merits of the rival routes, but we are expecting to hear before the next issue.

The Leasowes.—We have been in correspondence with the Birmingham Civic Society on this subject, and we feel sure that some action will be taken to save this place, which has been the subject of so much publicity. Havelock Ellis wrote :

“Shenstone is ranked among the minor figures in literature. Yet he has always been a significant figure for those who are able to see what he signifies and to-day his significance not only for England, but for Europe generally, continues to increase.”

Both Mr. Saintsbury and Canon Hutton have independently referred to the undue neglect of Shenstone.

Farnham.—We have received the following statement from Lloyd's Bank :—

“The Directors of Lloyd's Bank, after giving the matter their most careful consideration, have regretfully decided that, in order to meet the pressing need of increased accommodation, it is necessary to rebuild their offices at Farnham.

As the existing premises were designed by Norman Shaw, the Bank would have much preferred to have retained them had it been considered possible to adapt them to modern requirements, but, although much thought was given to this wish, no solution of the difficulties has been found. It is the settled policy of the Bank to maintain and preserve its premises throughout the country whenever possible where the buildings are of ancient or historical interest, or when they are examples of the work of an architect who had such a marked influence on modern architecture as had Norman Shaw.”

This statement was accompanied by a very courteous letter thanking the Society for the opportunity afforded them of making this statement. We are a little at a loss to understand how increased accommodation is to be obtained without purchasing adjoining property, as the building to be pulled down was uncomfortably high. Will the Bank favour the Society with a diagram of their new elevation, which, no doubt, is already prepared, and which will be illustrated when it is built, as is so customary ? They might, through their advisers, make some reflections thereon which would be of value.

Since writing this we observe that the design for the new Bank is in the Royal Academy. The matter shall be referred to again next week.

Art.—The Spanish Ambassador opened an exhibition by a young Spaniard, De la Serna, at the Bloomsbury Gallery on Friday. He has a tremendous sense of colour and decoration and real originality. He is a modern and yet is in no way tied down to any particular school of modern painting. He groups fruit and flowers against beautiful backgrounds and his pictures would be a real acquisition to a modern wall. One does not often see pictures of this kind so decorative and yet with so little regard for convention ; he makes patterns out of figs and pomegranates, and there are Spanish and Riviera scenes both cool and sunny and exquisitely painted. May one also add a word about the frame ? They are of

immense value in this type of decorative painting and must have been designed by the artist himself. They are not in any way elaborate, but some in silver and dull glass and each specially suited to the painting give the whole thing a great sense of completeness.

Books.—*DESERT ISLANDS*, by Walter De la Mare with decorations by Rex Whistler is a most original and delightful book. We remember some time ago a certain periodical used to have a list of "Books to Buy" and "Books to Borrow," this is most undoubtedly a book to buy; it is a refreshing study of adventure of the Robinson Crusoe type written with Mr. De la Mare's own particular genius for getting charm and romance out of everything. Here he certainly waves a magic wand over the desert islands of fact and fancy and Mr. Whistler most ably and decoratively falls in with his mood. The cover is an amusing satire with the castaway sitting under his palm tree and a very disapproving mermaid clinging to the rocks.

We would recommend a little book handed to us the other day by a well known Oxford Professor. It is called "The Specialist" and published by Putnams, and on the cover we read as follows:—"The fame of 'The Specialist' has already reached England. It is a homely and innocently Rabelaisian little book which in less than a year has established itself as a minor American classic and sold over 300,000 copies." American humour can be very trying and almost completely unfunny to the English sense, but this little book is so ridiculously and innocently written, that we should like to bring it to the notice of all who like a short book and a long laugh—it is colloquially speaking "a scream."

An interesting book on the English countryside, is published by Messrs. John Lane. It is called "The Penn Country and the Chilterns" and it describes with much lively anecdote this very charming part of the world. It is written in a series of rambles, the author pausing every now and then and metaphorically leaning on the stile to tell a story or point out some historical or beautiful object. Many books of this kind have been written, but this is especially readable and the ideal book for anyone living in this part of the country. We understand that Messrs. John Lane are bringing out a series of these, and if they are all as entertaining as this one it ought to be a really delightful set for lovers of the English countryside.

Theatres.—"B.J. One" must not be allowed to disappear from London! This fine play was put on a few weeks ago and the rumour has gone round lately that it was only being retained for a short run. But why? It is an excellent drama and as full of real thrills as any Edgar Wallace enthusiast could wish—in fact the audience are quite worn out with excitement at the end of the submarine battle scene. There are three acts; the first shows the Admiralty and occasionally the

lighter side of war. The second is the battle of Jutland, and the third the post war problem. Of course one cannot help mentioning "Journey's End" and though "B.J. One" has not the intensity and beauty of the latter, yet it is quite worthy to stand with it as expressing the naval side of the war, and expressing it magnificently. If this play fails, London loses a great production as well as a very good play. The battle scene is the most convincing thing we have seen for a long time, and the setting and production are very good indeed. Mr. Maurice Browne and Commander Stephen King-Hall are to be congratulated on giving London such a fine war play.

The Royal Academy.—The chief thing that strikes the visitor to this year's Academy is the large number of excellent portraits and an almost total absence of a great many characteristic old fashioned paintings of former years. It is undoubtedly a change for the better, and there is a fresh and vigorous atmosphere about the whole exhibition. To begin with, we have two or three quite superb works from such painters as Orpen, John and Greiffenhagen. The last mentioned has a splendid portrait of Lieut.-Col. Hutchison; John, of course, has made a sensation with his unusual and delicate portrait of Tallulah Bankhead; Orpen is most characteristically represented with "William Tennant, Esq.," but a picture of his which seemed to us delightful and did not seem to be attracting much notice was a lovely painting of "Mother and Child." Even among all these, however, almost the finest portrait in the exhibition is David Jagger's portrait of the Queen: it is beautifully painted, regal without any of the usual trappings of royal portraits, and with a daring colour scheme of sapphire velvet and skunk fur—a completely satisfying picture.

There is a very striking decorative picture by Anning Bell, entitled "The Sea Maid's Music," and the much discussed "Were you there when they crucified my Lord?" attracted a great deal of attention and comment—it has a dramatic idea behind it, and though unpleasing as painting, it has an intense and compelling strength. This is no trivial problem picture painted for effect.

The women are well represented, and three important contributors are Dame Laura Knight, Flora Lion and Madeline MacDonald. We always expect vivid and beautiful colour from Laura Knight and she does not disappoint us. She has an amazing gift for making her colour tell, even in a room blazing with colourful canvases, and this year she has a brilliant study of a circus rider and another of a ballet dancer and a dressmaker, both with her peculiar facility for reproducing the garish fascination of the circus. The portrait of Miss Nancy Beaton by Flora Lion is an attractive study of the modern girl in a quaintly cut black velvet jacket. Miss Madeline MacDonald is not so impressionistic, but there are two or three good examples of her delicate painting which is much more based upon the tradition of the Flemish School. Her portrait of "Mrs. McDonald" is painted

with great delicacy and feeling as is also a much smaller picture of a baby by the same artist.

This year, however, it is much more difficult to quote isolated examples and we feel in spite of much adverse criticism, that it is a very good academy indeed. There no longer seems to be that gulf cast between the old school and the new. However much interpretations alter, the convention which produced the pictures of Highland cattle and other variations on an original theme has really disappeared—at least there seems to be a freedom and feeling of compromise between the traditional and the moderns which would have been impossible a few years ago. What will come of it, it is impossible to say, but certainly it makes for a better and more representative Academy than we have seen for a long time.

Tynninghame Bridge.—Lady Binning, who has been so generous a supporter of the Society's work at West Wycombe, drew our attention to the proposal to rebuild this beautiful bridge. We have been sent a photograph of the bridge and the working drawings of the new bridge. So many old bridges are either being widened or destroyed that it seems worth while to illustrate this and make some comments thereon.



ARCHITECTURE AT THE ROYAL ACADEMY

† The Mistress Art of Architecture can surely make a better showing in actuality than in its pictorial presentation at the Royal Academy. The small room devoted to examples of the art of building in England during the year is largely devoted to examples of stained glass. We counted about thirty-seven different designs, which is a very considerable increase on the usual number of designs for an art which is almost a lost one. Cartoons for stained glass are always misleading—they are really only the data for the production. If the Academy are anxious for the public to be interested in stained glass, let it have a room devoted to this, and show the actual glass. But, surely, this is better in an exhibition of the Crafts associated with fine buildings. These large cartoons must have displaced a considerable number of architectural drawings. It would be interesting to know how many were rejected. It is clear, however, that there is a considerable lack of interest in sending in architectural designs to the Academy. There are ten Architect Academicians, five of whom are unrepresented. We naturally looked anxiously for Sir Edwin Lutyens' contribution. His name is only connected with some business premises in Oxford Street—Messrs. Gamage's, no doubt. We were hoping to see the plans for his very interesting Housing Scheme in Westminster, sketches for which have appeared; but still more the preliminary sketches of the great modern Cathedral in Liverpool, which has been the subject of so much publicity. Sir Herbert Baker shows his India House, Aldwych, and his Christian Science Church in Great Smith Street, in the design of which he seems to be much more at home. Would it have been more characteristic of London if it had been built in ordinary stock bricks and Portland stone? He also shows, in a very attractive drawing, his proposed additions to Downing College, Cambridge. The lay-out of the new buildings seems to be just right, and this should be a real addition to Cambridge architecture. Sir Gilbert Scott gives us more details of his Liverpool Cathedral. But where is the design for the great new Library for Cambridge? A model was shown at Cambridge. The public would have been considerably interested to have had an opportunity of seeing this in London. As it is, they will probably be as interested in Mr. Wornum's little housing model for the Earl Haig Memorial Homes at Liverpool as anything in the Exhibition. But surely it is relatively unimportant, charming as it is, in comparison with all the great housing schemes springing up everywhere quite uncontrolled. Sir Edwin Cooper, the newly elected A.R.A., shows nothing, although his name is associated with a number of monumental buildings. We were looking to see Mr. Curtis Green's design for the new Dorchester House. Surely this would have been a centre of attraction. It would be instructive to see this exhibited side by side with Sir Owen Williams' amazingly interesting expression of the logic of concrete building. Mr. Curtis Green prefers to exhibit in the Water Colour Room some very attractive sketches. Mr. W. J. Tapper has four exhibits, three designs for churches, but he does not say where they are. He also has a design for a waterless gas-holder. Sir Reginald

Blomfield's design for a street in Leeds has surely been illustrated before. He also shows one of his characteristic delightful drawings in another Gallery. But where, for instance, is his bridge at Stratford-on-Avon? Surely a most important commission. Mr. E. Guy Dawber also seems to prefer to be represented in another gallery, and only shows one of his delightful and characteristic houses in Hertfordshire. Mr. Joseph Emberton's Empire Hall, Olympia, provokes more attention probably than any other design in the room. We admit all the decorative skill in handling his solid and voids and the successful treatment of a great blank wall with sufficient interest without using any of the recognised formula of architecture.

We liked also Howard Robertson's and J. M. Easton's new premises in Kensington High Street, and Mr. Leo S. Sullivan's buildings in Gracechurch Street. As usual the room was full of delightful drawings of domestic buildings, but as they were unaccompanied by photographs, many of them may possibly be only pictures. Take, for instance, "House at Swanage." If the materials indicated are used, this design cannot fail to be pleasant in a town which has been sadly unfortunate in its development. We shall look out for this in actuality. But after all, it is the definite control of the site in the adjoining buildings, and the materials, which make architecture satisfying in being. No Exhibition of Architecture can be satisfactory unless these conditions are shown by photography or by drawing made from the completed building.

THE NEW DUBLIN

Dublin for a great many years was a neglected city. She was always a capital city, nothing provincial about her, but she drowsed, a Queen in rags.

She had been nobly designed and proportioned. John Claudius Beresford, first Commissioner of Works, who, in the 18th Century built her great streets and squares, had the services of an architect of genius, James Gandon, for the planning of the re-made town. Beresford had the Norman munificence in building and he did not spare the public money. The Custom House, Gandon's masterpiece, though somewhat damaged in the Revolution, still stands in lonely beauty against the beautiful broken lights and mists of the atmosphere which is Ireland's own.

The great buildings survived, but there was little care taken of them. Dublin is particularly an 18th Century city and it is full of beautiful old 18th century houses nobly proportioned and beautifully decorated by the Italian and other artists whom Beresford summoned as by a wave of the wand, over all the seas, to perfect his new Dublin.

She has suffered, is suffering, the fate of old cities. Long ago many of her beautiful houses had become tenement houses for the poorest class of inhabitants, or they were offices or ware-rooms of some kind or another. Decay had long been eating into them as it has with certain parts of London.

Dublin used to be administered—or not administered, by a Corporation which

was at once extravagant and neglectful. It had the good humoured *laissez-faire* which belonged, or belongs, to the Irish. English efficiency, in the handling of domestic affairs, was not much in evidence in Ireland in those days. The Corporation did pretty well what it would. It would not have thought of interference in such matters as the cleaning of the streets or their lighting. It provided a very excellent water-supply, but the Vartry water was perhaps too precious to be used in cleaning the streets or anything else. Dublin was built on a swamp. Therefore, Dublin must be muddy. The Dublin mud was greasy and slimy ; it was in waves. It never came off anything it defiled. I remember Dublin, sad and dusty on Summer evenings, when most of the well-to-do citizens went to their houses in the suburbs.

There was not a big traffic in the old Dublin, but it was extremely dangerous because it was reckless. I can remember the procession of hackney cars and carriages to the Horse Show at Ballsbridge. It was quite impossible to cross the route. One giant policeman stood at the junction of Dawson Street and Nassau Street and the traffic went round him as though he had been Nelson's Pillar.

I believe we liked the inefficiency ; it amused us. I know one exile of Erin who loved to plunge into the Cimmerian darkness of the roads round about Dublin after she had arrived by the mail-boat at Kingstown. Halcyon days and nights ! I remember the excuses of the driver of an unlit outside car. We had not rebuked him ; we loved the inefficiency because we came home to it. " I left the car outside a house th'other night and the lamps was stole on me, your Honour." These were the soft, cozening Irish ways.

There is a great change over Dublin. The new Government is composed of hard efficient young men ; not a touch of sentimentality about them, unless perhaps Mr. Blythe's passion for the Irish language. He is a Northerner of course. There was a man among them who saw visions and dreamed dreams, but they were of things which should become realities. Kevin O'Higgins saw a lit Ireland and it has come to pass.

Just three years ago I drove in glimmering darkness through some of the best residential streets in Dublin. The City is beautifully lit now, the main thoroughfares like a Cave of Aladdin on a Winter night. The Shannon scheme is in being over the late pitchy country-side.

The streets are clean. One would have said that the hard efficient young Government was out to stab Irish self-sufficiency through. As they had given the Shannon Scheme to a German firm so they gave the street cleaning of Dublin to a Frenchman. At that we rocked with laughter. We knew the French.

Hey presto ! The mud has flown from Dublin streets as before the great glory of the revealing light. Perhaps that was what was the matter. The dingy Dublin house-fronts show a clean face. The shops, if they are less well filled than of old, have learnt the science of window-dressing and window-lighting. There are flowers all the year in the courts of the Government Buildings and other public

spaces. The citizens are gardening all over the suburbs. What used to be cat-runs are now charming gardens. There are little bunches of rosy lamps half way up the electric light standards in the streets. I am told they are for the purpose of directing traffic. At least they do it beautifully, as though the standards had suddenly grown the pomegranate fruit and flowers.

We are becoming beauty-loving at last, not leaving it all to the Anglo-Irish as of old. Dublin women have yet to learn the science of dressing. Perhaps it is the climate. They are neat and efficient as they used not to be—in appearance, I mean, but one sighs for the feminine garb of London in a fine Summer. They dress oddly alike in rather dull mixed colours. When you see someone really well-dressed, you feel as though Summer had come.

For the traffic now—it is at last well conducted. The big young policemen, white-gloved like their London brethren, have learnt about directing the traffic, and they are so pleasant that they send you on your way with a queer sense of happiness.

Dublin is incredibly brighter than of old, though there are dark spots—the slums, the poverty, the unemployment. Perhaps they will vanish in time before the light which floods the country from end to end. Perhaps it is all a matter of the light. Now one comes to think of it perhaps there would have been no Revolution if the Shannon Scheme had come into being before the Free State, and the young, hard, efficient Government with only Mr. Blythe's dream of the Irish for sentiment, might never have existed.

KATHARINE TYNAN.

NOTICES

NEXT WEEK

WEDNESDAY, MAY 14TH, at 8 p.m. (Ordinary Meeting.) CHARLES E. DOUGLAS M.I.Mech.E., M.I.Struct.E., A.M.I.Pet.T., "Rice Cultivation and Treatment." SIR EDWARD DAVSON, Bt., Deputy Chairman, British Empire Producers' Organisation, will preside.

REPRINT OF CANTOR LECTURES

The three Cantor Lectures on "Wind Instruments from Musical and Scientific Aspects," by Dr. E. G. Richardson, Ph.D., D.Sc., Lecturer at University College, London, have now been reprinted in pamphlet form (price 2s. 6d.), and can be obtained from the Secretary, Royal Society of Arts, John Street, Adelphi, W.C.2.

A complete list of Cantor, Howard and other lectures, which are available in pamphlet form, can be had on application.

PROCEEDINGS OF THE SOCIETY

EIGHTEENTH ORDINARY MEETING

WEDNESDAY, MARCH 26TH, 1930

CHARLES MARRIOTT, Hon. A.R.I.B.A., in the Chair

THE CHAIRMAN said that Mr. Howard Robertson's best introduction to the audience was his own work. He was thinking especially of the lecturer's new building for the Royal Horticultural Society, which Mr. Robertson and his partner designed. Last year it was awarded the Medal given by the Royal Institute of British Architects for the best building erected in London during the previous two years. And those who happened to visit the Paris Exhibition of the Decorative Arts in 1925 might perhaps remember the very charming British Pavilion. That, also, was designed by Mr. Robertson and his partner.

He did not propose to try to anticipate what Mr. Robertson was likely to say about the architecture of to-day and to-morrow, but from the evidence of his work, the speaker could form a fair idea of the very sane line he would take. And he would like to give to his hearers two quotations, which he had culled from two widely different sources: from the lectures of Sir John Soane, who was the architect of the Bank of England, and from a book on "Modern Architecture," by Herr Bruno Taut, who was the present leader of the Modernists in Germany. Sir John Soane said: "On all occasions we must avoid servilely copying either Greeks or Romans, the Italians or the French. So much depends on locality, climate, materials, and modes of living." And then he went on to say, "We must be intimately acquainted not only with what the ancients have done, but endeavour to learn from their works what they would have done."

And, after more than a century of time, Herr Bruno said, "The aim of architecture is the creation of the perfect and therefore also beautiful efficiency." He (Mr. Marriott) did not remember anything he had ever read about architecture which appealed to him so much as the word 'therefore' in that sentence. Many people seemed to be always quarrelling about the difference between efficiency and beauty; and this man Taut pointed out, by means of the subtle word 'therefore,' that if everything was perfectly efficient, *i.e.*, if it pleased people's minds as well as their bodies, it must be beautiful. He had merely wished to indicate what was in his mind as to the sane conduct of architecture which Mr. Robertson represented.

The following paper was read:—

ARCHITECTURE OF TO-DAY AND TO-MORROW

By HOWARD ROBERTSON, F.R.I.B.A., S.A.D.G.

Principal of the Architectural Association Schools

In showing you a series of pictures, I hope you will not assume that what I shall show you is necessarily something which I, personally, admire. I make that reservation at the beginning of the lecture, because sometimes at the end of a lecture I have been hauled over the coals for showing work which could not be called admirable. So I excuse myself at the outset; what I have chosen to represent is types, rather than perfect types.

Architecture arises from a proper satisfaction of the building programme.

Into architectural design at all periods of history have entered three main governing factors : firstly, the programme of practical requirements, i.e., the function or purpose of the building ; secondly the structure, by means of which practical realisation is given to the programme ; thirdly, the relationship, through design and decoration, of the material building to the abstract human emotions. This latter is the element which Sir Henry Wootton termed " delight." It relates to pleasure, but to the other human senses and emotions as well.

The evolution of architecture is traced through the development of these three factors. Modern architecture is that which responds to the programme of the day, is built according to the methods of the day, and fulfils the " pleasure " requirements of the day. There is, therefore, no modern style as such. All architecture which, in its period, was what we call advanced, i.e., fulfilled its purpose up to the available limits of human achievement, was modern. Even a revival might be modern, provided it were in tune with the material and aesthetic needs of its day.

The evolution of the programme is linked with the march of civilisation, the growth of culture, the extent of material demands. In the realm of domestic architecture the programme of to-day varies little in its main factors from that of 2,000 years ago. We still live in individual cells called rooms, in small houses or in flats. And even the latter are not new inventions, for flats existed in Ostia 1500 years ago, and were actually fitted with a form of central heating.

The demand for change in domestic design has been slight up to the present day, and is confined in the main to improved equipment, sanitation, better utilisation of space, and better control of light and air.

In other categories of building, however, the programme has greatly changed. Commercial demands of to-day have no precedent in antiquity, huge factories equipped with marvellous plant, great office buildings with rapid means of vertical transport (lifts), railway and air stations with vast spans, shops in which a maximum of uninterrupted floor space is required, theatres, concert halls and cinemas holding thousands, all of whom must see and hear perfectly. The programme here has been shaped by modern science, and is, therefore, a new one. Hence, while domestic architecture evolves slowly, commercial and public architecture undergoes rapid and constant changes.

As regards structure, that too has changed, and since structure is the second great influence, we find that fresh conceptions of structure profoundly modify architectural expression. With each great structural revolution corresponds a great change in design.

The main phases of structure are marked by the development of the post and lintel, exemplified in early civilisation and finding its best expression in Greek architecture, which is revered because of its perfect development of that structural principle. Second, comes the development of the straight lintel into the curved lintel, the monolithic vault without thrust used by the Romans. The principle of the pier or wall supporting an inert mass still, however, remains.



* A pioneer work in modern office building,. Adelaide House, London.

(Sir John Burnet & Partners, Architects).

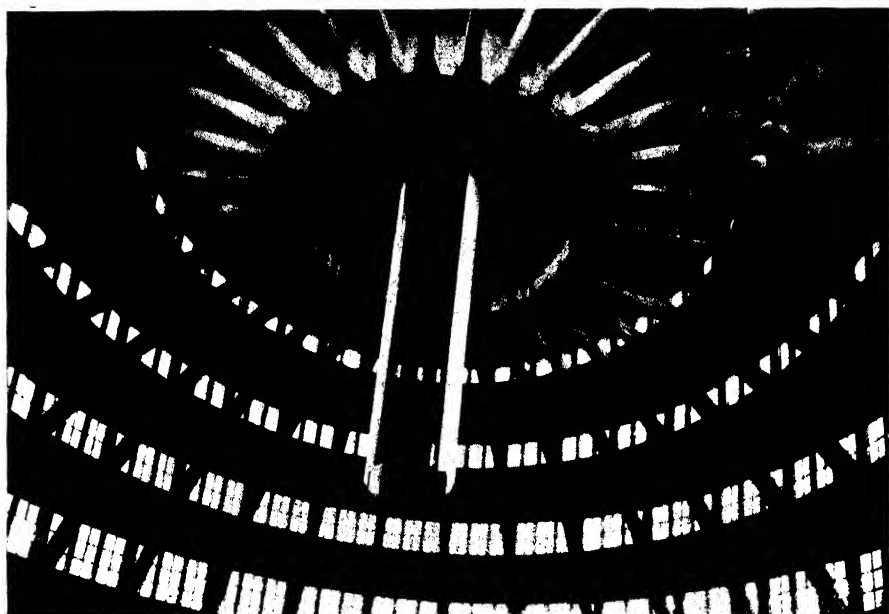
Thirdly, comes the Gothic vault, a structure of mechanics—action and reaction—resulting in the architecture of poise.

Fourthly, comes the steel frame, more similar in principle to Gothic than to Greek, an architecture of tension and compression, in which the direction and nature of the stresses differ from those of the vault. The steel frame is a revolutionary discovery, one bound to modify profoundly the architectural expression.

And lastly we have the concrete frame, which differs from the steel frame because of the nature of its make-up. This structure gives rise to plastic architecture. Like the steel frame, it eliminates the wall as a weight bearing element, but being essentially a structure of post and slab, as opposed to stanchion and girder, it permits the introduction of fresh elements in design such as the cantilever and overhang. In consequence once more the expression of architecture becomes subject to fresh change.

* Reproduced by kind permission of Mr. F. R. Yerbury.

These five phases of structure are basically different. Small wonder, therefore, that it is practically impossible for the designer to be in the full sense traditional. Evolution proceeds, not gradually, but by successive leaps. Hence the architect can only logically develop expression according to the phase which is governing at the time. One works, or should work, in the light of the structural knowledge of to-day, and not limit oneself to that of yesterday.



* The skeleton frame in concrete of the Dome of the Centennial Hall at Breslau.

(Max Berg, Architect).

Concrete structure has given us the great Festival Hall at Breslau, the Frankfurt Market, the churches of Perret and Moser, and a host of other buildings, the expression of which is influenced by materials. They are typical, as are the Lyons market and the Woolworth Tower of a structure of steel. For without steel both of these become unrealisable.

To-morrow we may have other methods, and still another expression.

As for the third factor, aesthetic pleasure, that is bound up with climate, race, education, development, influences. The world is subject to fashions, waves of feeling and emotion, licence and freedom, or Puritanical restriction, phases of vulgarity, periods of eclecticism.

Architecture reflects these, as it should. It reflects, in particular, the personality of the designer, himself the product of the civilisation in which he finds himself.

As regards present-day achievements, it is greatest in those buildings which are

* Reproduced by kind permission of Mr. F. R. Yerbury.



* A splendid example of modern commercial architecture. The new wing of the Siemens Schuckert factory near Berlin. The construction is steel frame.

(H. Hertlein, Architect).

typical of this age—offices, factories, railway stations, market halls, theatres and cinemas, and communal dwellings on a large scale.

These buildings are no longer merely the enclosure of space by walls and roofs to give shelter and seclusion. They have become living machines, equipped with a complex mechanism of lifts, heating and ventilating, electricity, and all the plant required for specialist services.

Thus they become dynamic instead of static. And their expression tends to-day to suggest the hidden forces within.

This factor largely accounts for the interest and satisfaction which truly modern buildings awaken; they respond to something which forms a background to present-day existence.

The realisation of function is something which impresses itself in every direction, and particularly on the youth which is born into a world concerned with practical considerations and scientific progress. Contact with mechanism occurs at an early

* Reproduced by kind permission of Mr F. R. Yerbury

age. The child plays with toy motor cars, yachts, scooters, and later with motor bicycles, cars, and even aeroplanes. A sympathy with mechanism and its efficiency grows, bringing with it impatience against old fashioned methods and inconvenience. The demand of the future generation towards architecture is likely to be increasingly exacting, and it will be concerned rather with perfect function and service than with archæology or style. Formulæ in design, as established through subservience to period style, will fall into disfavour, but will be replaced by an increasing knowledge of design principles, a revival of the study of geometrical proportioning, an application of methods of achieving harmony and rhythm in form. Already men like Le Corbusier have studied Greek work, its geometrical basis, and have done so primarily with the idea of isolating basic design principles and applying them to modern building forms.



Functionalism applied to the home.

*The first-floor Living Hall of a house at Garches. Behind the book-case is the open well looking down into the entrance hall below.

(Le Corbusier et Jeanneret, Architects).

Germany, Holland, and Central Europe generally, together with Soviet Russia, have accepted enthusiastically a functional architecture with an æsthetic appeal to the eye through the significance of form rather than the reminiscence of style. This attitude is gaining ground in England; and once established, the newer architecture will create its own response to the demand for humanism in design. This will come

* Reproduced by kind permission of Mr. F. R. Yerbury.

about through a revival in craftsmanship, decoration through sculpture and colour, and is already evident in the increasing contact between architecture and the applied arts.

In large cities traffic considerations will be a big factor in architectural design. Two-level streets, the introduction of tall buildings at cardinal points to relieve pressure on ground space, may create new architectural motifs ; in any case, it is likely that an increase of glass area, and a lighter and more economical method of walling than the present system of brick and stone will profoundly modify externals. The elimination of excessive smoke from cities is a first important step, and the immediate hope seems to lie in intensive electrical development. In any case, it is probable that future city architecture will take account of the possibility of using the flat roofs of buildings for recreation and pedestrian traffic, for better conditions of light and air will always be obtainable at the highest levels. Already in American cities the topmost flats and offices command the highest rents and the forthcoming Chicago Exhibition will witness a complete system of roof level circulation.

Modern decoration reflects the trend of major architectural forms. Many so-called modern ideas are not new ; for instance, steel furniture, which appeared as long ago as at the time of the 1851 Exhibition. But the expression has altered and appears novel in its present form.

Taste to-day is improving. Design is valued for its own sake, regardless of period. But the level is still low, particularly in street architecture, where the legitimate demands of commerce in the way of shop fronts, advertising by illuminated signs, etc., is being met in a very mediocre way. The possibilities of light, for instance, are only dimly felt ; and cinemas and theatres, on the façades of which signs must inevitably find a place, are still designed with an architectural cloak which takes no account of this vital element. The architect is partly to blame, but more so the building owner, who is lacking in imagination and in confidence. The vicious circle so created is, however, gradually being broken.

England is terribly conservative in architectural design. One reason lies in the comparative stagnation of the past fifty years, and the lack of an evolutionary link between the past and the future, which makes it difficult to create new forms alongside of the old. Another cause is the reflection, in architecture, of the attitude which looks with satisfaction on past supremacy, and has neglected the progress made in other countries.

It is likely, however, that the younger generation of architectural students, who are alive to the necessity for a changed outlook, will bring about a great development in which the spirit of modern design will be acclimatised to England. This hope for the future will, however, be greatly jeopardised by any extension of the idea of official architecture—extensive public works designed by government departments. This menace looms large at the present time, and is utterly opposed to progress in the arts which requires freedom to create, and a healthy and natural competition. Officialdom creates routine, and architecture in England, if it is to regain its vanishing prestige, must be released from the routine outlook.

These structures, like the reinforced concrete grain elevators, have become popular. Their mass is interesting, and they have become the inspiration for much modern work. Indirectly, you find the same idea of mass in buildings of a different type. The effect on us of a building such as I show you *here* is that of something which is attractive through its force, and which influences one in design. If you get the power of mass beginning to be appreciated by people everywhere, it has its influence on the individual. And I think that, at last, mass has come into its own. The "mode of the moment" is mass, the cultivation of fine mass. It corresponds well to our economic need at the present time. We must fall back on the fundamental principles of architecture. In our country people have been impressed by mass, but they have not had much success in application.

There is one thing the Germans are doing, and which we might very well do too; that is, take some of the bad old buildings and give them a good shave. The Langham Hotel badly wants a shave, and there are several people in this room who would be capable of taking an architectural Gillette and making a fine job of that hotel.

DISCUSSION

MR. A. R. POWYS said he had enjoyed listening to Mr. Robertson's lecture, and seeing the pictures with which it was supplemented. He felt a great deal of sympathy with modern architecture; in fact, he considered that architecture being executed to-day could not be regarded as seriously good unless it was of our own day. He would like to make a distinction, throwing out a suggestion, which others might like to take up, and perhaps contradict. On the one hand there was architecture which was normal to our day, *i.e.*, an architecture that resulted from the use of up-to-date structural forms and the materials now on the market such as some which had been illustrated on the screen, and on the other hand there was that kind of architecture which was consciously designed in the *modern style*. When one considered a work done—a picture, or furniture, or architecture—which was executed deliberately in some style or another, whether it was in the Gothic manner, or in the manner of the Renaissance, or the *modern* manner, one was almost certain to have a sense of disappointment with it, because it did not ring absolutely true. He thought that was the danger that threatened us. Not that good, normal, workaday architecture, done in a sensible up-to-date way, could be offensive to us, though this would rightly be called modern, but that we should be bewitched by some of the results and try to imitate them ourselves, thinking more of the *style* than the *being*, and thus fail to produce sensible buildings fit for modern use and of seemly appearance.

MR. R. A. DUNCAN said that the only point he would like to make was the following. It was well known that civilisations ran to a sort of climax. At the climax all the art, in fact, everything that a race of people did, expressed the character of that people's civilisation. It would be found that in the history of Europe there were at least two great climaxes. One of them was the Greek, which ended with the Roman. That worked itself out. In its place came a new idea, the idea which owed its introduction to Christianity. This brought about a certain expression. It changed its character at the Renaissance, but without that violence which had

seen the fall of the Roman Empire. Within the Renaissance, however, was another aspect and view of life, namely, the scientific view. It was something which was different from what man had done before, and we were just beginning to see its expression, because the artist, as the speaker saw him, was an expressionist. Art was not a cause, but an effect, and one was now beginning to see the effect of the scientific point of view. He thought Mr. Robertson would agree with him that to some extent the painters, the cubists, and some of the architects, Germans, and certainly le Corbusier, were influenced by the more recent scientific expression in physics and other departments of science. It was not only merely utilitarian in its point of view, it was an attempt to harmonise with our true outlook. That, at any rate, was what he felt about it. When he saw a man making even a slight attempt in this way he felt that he was endeavouring to harmonise with the concept of life at the present time. That was, at the moment, a little in front of most people, but he was convinced that it was coming, and he thought it would present a new civilisation altogether, something which had never been seen before.

MR. J. H. BENNET said he had enjoyed Mr. Robertson's lecture immensely. He was a little surprised that no reference was made in the lecture to the new architecture in Holland. The speaker had seen many references to the recent examples of architecture in that country.

Another point was in relation to the buildings with a large area of glass. He was reflecting that there must be a new industry, that of window cleaning, necessary for such buildings of which instances were shown, as in Paris.

MR. ROBERTSON, in reply to the last speaker, said his neglect to show examples in Holland was due to the fact that the new work there was on all fours with that in Germany, *i.e.*, in regard to its modernism.

With regard to the glass-cleaning problem in the very big window, it was not an insoluble one. In the case of the garage he had shown it was faced, and it was said that the cleaning was not difficult. A whole new race of aerial acrobats had come into being, and they had a simple kind of scaffolding let down by pulleys from the top, and in that way the very large glass front was cleaned fairly easily. It was given a good wash down every three weeks, and it was not a serious item in their expenditure.

He also thanked Mr. Duncan for his remarks. He thought that gentleman was very right in what he said. He had, the speaker knew, thought a good deal about the subject, as he had heard him speak about it on a former occasion.

He agreed with Mr. Powys. He knew Mr. Powys' interest in good old work and in good modern work. Everyone would agree with that speaker that modern architecture, which was merely in a manner, would not last. That was the rubbish which grew about every real movement, and one had to accept these shoddy little shops, etc., which were called, by some, "modern architecture," and to recognise that a certain amount of scum appeared on the surface of every deep pool. It could not be avoided.

THE CHAIRMAN remarked that before proposing a hearty vote of thanks to the lecturer, he would like to make a few remarks, bearing on some of the points which struck him while Mr. Robertson was speaking.

One point which Mr. Robertson did not touch on seemed to bear on the distinction made by Mr. Powys, the distinction between the architecture which arose naturally out of our day, and the architecture which deliberately aimed

at a new style. That point was the question of labour. Professor Lethaby once said he thought that one of the most interesting histories of architecture which could be written would be a history of building materials. He (Mr. Marriott) would go further and say the history of building methods would be intensely interesting. It was obvious that one would not get the same sort of architecture out of concrete mixers and girder rivetters that one would out of bricklayers and marble carvers. And what struck him about the present day was that there was an architecture arising out of the kind of labour available. Against that people might say that the architectural capacity was primarily one of designing, and that the rules of designing were the same in all ages. But precisely the same might be said about warfare, that, in the final result, it depended upon military genius. But if military genius had at its disposal the Roman short sword on the one hand, and on the other, the long-range gun and the aeroplane, obviously one would not have the same sort of battle. The same kind of thing was happening in architecture: the forms which arose in the past arose out of the kind of labour which was available. At the present day we were getting a different sort of labour, and in consequence getting a different architecture. The responses to change in life were not immediate. The idea was beautifully summed up, though rather vulgarly, in the title of the American song: "Father's pants will soon fit Willie." Anybody who had had children to bring up would agree that a certain type of garment would last for a certain number of years, but when the boy was growing up there inevitably came a time when that garment could not be taken in or let out any more, and so it had to be discarded and something else obtained. It was much the same with architectural styles. The style would last over certain changes in civilisations, but then there came about changes of a radical nature, like those of labour and materials, and then the style came to an end; it could not be stretched or adjusted any more. Then the architect had to go back to fundamentals, and build according to the kind of labour he had at hand.

Those were some of the reflections which were excited in his mind by the admirable lecture just delivered.

The audience probably knew Mr. Robertson's work, and ought to feel happy that—Mr. Robertson being Director of Education at the Architectural Association—the training of the young was in the hands of a man who took such an extremely sane view of architecture. He asked the audience to pass a cordial vote of thanks to Mr. Robertson for his paper.

The vote of thanks having been carried unanimously, the meeting terminated.

NOTES ON BOOKS

JUTE AND JUTE SPINNING. By Thomas Woodhouse, F.T.I., and Peter Kilgour.

This two-volume book is a second edition, the original issue having been published in 1920. The authors have added an appendix, which brings the volume up to date by describing new methods of batching jute with the addition of clensel, and similar materials, and describing improvements for cleaning and carding the raw material.

The opening chapters give an excellent description of the growth, retting, grading and baling of jute, the second chapter being illustrated by photo-micrographs of jute fibre. The description of this important process, as carried out in India, is

valuable for spinners who can derive from these chapters information which could only be secured otherwise by a visit to India.

It is stated on page 10 that Bimlipatam jute, which is obtained from *hibiscus cannabinus*, may be considered as a kind of hemp. This is a common error, the fact being that *hibiscus c.* is the original jute plant, the name "jute" having been applied subsequently by those who were trading in what is now called the real jute, or *corchorus capsularis*, and *corchorus olitorius*.

The impression is created that the quality of jute is steadily deteriorating, thus forcing an additional burden on the spinner, which entails a steady improvement in the type of machinery so as to counteract the inferiority of the raw material. Here is a point worthy of the attention of the Government of India. Jute is a valuable crop and it is not satisfactory that the quality should be allowed to deteriorate, whereas other textiles, such as cotton, the grading of which is standardised, and flax, the grading of which has improved in the last few years, are kept strictly up to standard.

The authors quote N. C. Chaudhury as classing jute in five commercial divisions, and it should surely be possible to grade each of these divisions in a way which would correspond to the needs of spinners and represent regularity of quality from year to year.

The chapter on batching gives useful information and illustrates the type of machinery used in opening the heads of jute and softening the material before sending it to the breaker card. The remarks in the appendix in this connection indicate great improvements which have taken place in recent times in the preparation of the jute sliver, so that the best results may be secured in the spinning.

The chapters on the evolution of carding logically set out the object to be attained, describing the means for obtaining good results. In regard to twist, which is so important in the spinning of yarn, the authors allude to the necessity of uniformity of strength. This can certainly only be obtained by greater regularity in the type of fibre. The illustrations and calculations of the cards are admirably carried out, and should be of the greatest possible assistance to mill managers. Although no radical change has been made in the card in recent years, it is evident that the improved methods of construction in the adoption of ball bearings, etc., are all turning out a more efficient machine, capable of giving better results. The essence of good carding is well described on page 180, where it is pointed out that "it is absolutely essential that every strick should receive the necessary amount of carding. . . . Faults created or work imperfectly conducted in one machine cannot be remedied thoroughly in any subsequent machine." It may, indeed, be said that the crux of spinning lies both in the grading of the fibre and in the carding. If these are inefficiently done, no subsequent effort will enable the spinner to turn out a satisfactory yarn.

Regular feeding is of the greatest importance, and improvements in the lap or balling machines have assisted in this direction.

Page 237 gives an excellent definition of the usefulness of a machine: "The usefulness of a machine is measured in some degree by the range of articles which can be produced by it without any costly and lengthy alterations"; and, again, "In our explanation of the necessary requirements for the operation of carding, we mentioned the desirability of securing uniformity in the length and diameter of the fibres which are considered most suitable for use in the production of an approximately perfect thread."

Attention is drawn to the need of more research in regard to carding, and genera

spinning, and there can be no doubt that a field of considerable promise is open in this direction, as only by research and its application to the improvement of spinning and manufacture can we hope to be able to compete in this country with its dear wages, against the much lower-priced labour charges in India. The direction should, therefore, be towards perfect workmanship and the manufacture of such high-class articles as cannot be prepared in India. It is, perhaps, regrettable that the practice described in the book refers mostly to 8-lb. yarn, and no chapter has been written on fine spinning of $3\frac{1}{2}$ to 4-lb. yarn, such as is carried out successfully by few spinners.

Volume II is devoted to preparing, and a chapter might usefully have been added referring to the spinning. This volume is copiously illustrated with photographs and drawings of the various machines and the calculations of speeds, which should prove of great value to students or managers of mills. The explanation of the differential in the roving frame is very clear, and shows what a complicated mechanism this is.

The book is worthy of the highest praise, and both the text and the illustrations admirably set out the wide experience of the authors in regard to all phases of jute carding and preparing. The authors are to be commended for their modesty in avoiding dogmatism, and in setting out the facts, leaving the reader to apply these for himself.

In conclusion, no mill manager should be without this admirable work, which throws light on many of the important points which come up for daily consideration in the control of a jute spinning mill.

A. WIGGLESWORTH.

AIRCRAFT INSTRUMENTS. By C. J. Stewart, O.B.E., F.R.A.E.S., M.I.M.E. London : Chapman & Hall, 21s.

Before the war of 1914/18 the instruments used on aircraft were few and simple. At that time it was still thought rather marvellous that flight was possible at all ; instruments were regarded as rather unimportant accessories, and where a need was felt some existing device was usually pressed into service with the minimum amount of alteration. During the war the efficiency of aircraft increased enormously and more attention was paid to designing instruments suited to their special needs. This period of rapid development, which produced aircraft capable of flying at altitudes of over 20,000 feet and at speeds of over 120 miles an hour, provided experience which showed what was required of the instruments ; it also made available the services of many exceptionally gifted scientists and designers. During the war, however, the life of instruments was exceedingly short, and conditions were such that the problem of providing them in sufficient quantities overshadowed all others. Consequently the instruments produced were not particularly good, and special calibration was always necessary if accuracy was important.

During the last twelve years the Royal Air Force has depended largely upon war stocks of instruments which have been reconditioned to meet a more stringent standard, new instruments being introduced only to meet new requirements. Civil aircraft in this country depend almost entirely upon the service types. It is only recently that entirely new designs have begun to be introduced generally. During the post-war period, however, much experimental work has been done both in this country and abroad. It is probable that progress has been accelerated by the enforced rest from production, for it has made it possible to submit each new feature to much more searching and extended tests than would have been possible had it been necessary

to standardize for the purpose of production. The result is that it is possible to-day to manufacture instruments which are not only more durable and accurate, but which will also retain their accuracy over the wide ranges of temperature (from tropical to -40°C.) at which they are called upon to work. A very large part of the work leading up to these achievements has been done at the Royal Aircraft Establishment, and for the most part under the supervision of Major Stewart, who is the head of the Instruments and Physics Department. It is at this Establishment also that foreign instruments are tested and other inventions submitted to the Air Ministry examined. It would consequently be impossible to find anyone better situated than the author to write a book on aircraft instruments.

Whilst giving some slight description of the war-time types the book essentially describes the work of these twelve years of development. It is remarkably up-to-date; in fact many instruments are described which are as yet unknown to most pilots; in this respect the author has made full use of his advantages. A word also is due in commendation of the Air Ministry policy which encourages the publication of the results of its latest researches in such books as this and in the series of publications to which the book makes frequent reference.

The book is divided into a number of chapters, each of which is devoted to some particular type of instrument, chapters also being included which describe oxygen apparatus, navigation instruments and automatic pilots. The chapters usually trace the development of the particular device chronologically. Instruments of foreign origin are also described. There are many illustrations, a large proportion of which are sectional or diagrammatic and excellently suited to illustrate the descriptive matter of the text. The author has a facility for lucid description; this facility, aided by the abundance of illustrations, enables him to describe a very wide range of instruments in the space available. An interesting and useful feature of most of the chapters is a list of the desiderata for the particular instrument which frequently prefaces the descriptive matter and which is very helpful in appreciating the merits of the instruments described. Many useful data are given in the form of tables and curves and frequent references are made to published papers and other sources of information. The chapters which describe the methods of measuring height and air speed are particularly good.

It is a pity that the author has not expressed his opinion of the comparative advantages and disadvantages and stated the degree of application of the instruments which he describes rather more freely. In some cases instruments which have been tried and found wanting have been described on the same footing as their supplanters, and there are also examples of instruments which have scarcely passed out of the experimental stage of development. It would doubtless be wrong to criticise comparative failures too severely, and it would be still worse to omit them, for in a rapidly developing technique such as this many devices which are temporarily abandoned are brought off their shelves and reinstated as ripening experience shows their advantages or makes it possible to eradicate their defects; they may, moreover, embody features which it is valuable to illustrate.

The author is to be congratulated upon an extremely useful book on a subject which is not covered by any other published in this country. It contains a very large amount of information which, whilst primarily intended for those interested in aeronautical engineering, will also undoubtedly be useful in other fields. The variety of devices described is likely to stimulate and assist invention and so contribute to progress.

MEETINGS OF OTHER SOCIETIES DURING THE ENSUING WEEK.

- MONDAY, MAY 12.** Architects, Royal Institute of British, 9 Conduit Street, W. 8 p.m. Annual General Meeting.
Geographical Society, Lowther Lodge, Kensington Gore, S.W. 5 p.m. Discussion on "Nomenclature in the Himalaya." Opened by Major Kenneth Mason.
University of London, at King's College, Strand, W.C. 5.30 p.m. Prof. Dr. K. Budde, "Pictures of the Great Prophets from Amos to Jeremiah." (Lecture V.)
At the London School of Economics, Houghton Street, W.C. 5.30 p.m. Col. D. C. Cameron, "Some Administrative Difficulties of Mechanisation."
At the London School of Medicine for Women, 7 Hunter Street, W.C. 5.30 p.m. Dr. A. Lacassagne, "Treatment of Uterine Cancer by Radiations." (Lecture I.)
Victoria Institute, at the Central Hall, Westminster, S.W. 4.30 p.m. Prof. Dr. J. Garstang, "Joshua and the Higher Critics."
- TUESDAY, MAY 13.** Anthropological Institute, 52 Upper Bedford Place, W.C. 8.30 p.m. Mr. H. A. Stayt, "The Bavenda."
Civil Engineers, Institution of, Great George Street, S.W. 6 p.m. Annual General Meeting.
Empire Society, at the Hotel Victoria, Northumberland Avenue, W.C. 8.30 p.m. Sir Wilfrid Woods, "Ceylon with special reference to its Constitution."
Marine Engineers, Institute of, 85/88 The Minories, E.C. 6.30 p.m. Mr. E. W. Green, "Developments in Powdered Fuel Practice for Marine Service."
Petroleum Technologists, Institution of, at the ROYAL SOCIETY OF ARTS, Adelphi, W.C. 5.30 p.m. Mr. D. P. Rees, "Oil Well Deviation."
Queckett Microscopical Club, at 11 Chandos Street, Cavendish Square, W. 7.30 p.m. Mr. G. Tandy, "A Botanist on the Great Barrier Reef." Exhibition of lantern slides of Marine Organisms prepared by Dr. Sorby by Mr. D. J. Sconfield.
University of London, at King's College, Strand, W.C. 5.30 p.m. Prof. Dr. K. Budde, "Pictures of the Great Prophets from Amos to Jeremiah." (Lecture VI.)
At the London School of Hygiene and Tropical Medicine, Keppel Street, W.C. 5.30 p.m. Prof. Dr. A. J. Kluyver, "The Chemical Activities of Micro-organisms." (Lecture I.)
At the London School of Medicine for Women, 7 Hunter Street, W.C. 5.30 p.m. Dr. A. Lacassagne, "Treatment of Uterine Cancer by Radiations." (Lecture II.)
At University College, Gower Street, W.C. 5.30 p.m. Prof. W. E. Blatz, "The Modern Theories in Habit Training in the Pre-School Child."
- WEDNESDAY, MAY 14.** Fuel, Institute of, at Burlington House, W. 6 p.m. Dr. C. M. Walter, "The Utilisation of Town's Gas as a Fuel in Heat Treatment Furnaces."
Geological Society, Burlington House, W. 5.30 p.m.
University of London, at University College, Gower Street, W.C. 5.30 p.m. Prof. F. G. Cole, "The Early History of Generation and Comparative Anatomy." (Lecture III.)
- THURSDAY, MAY 15.** Asiatic Society, 74 Grosvenor Street W. 4 p.m. Anniversary Meeting.
Chadwick Public Lecture, at the Royal Sanitary Institute, 90 Buckingham Palace Road, S.W. 8 p.m. Mr. Edward Willis, "The Collection and Disposal of Refuse."
Chemical Society, Burlington House, W. 8 p.m. (1) Messrs. D. C. Jones and L. Outridge, "Adsorption by Silicic Acid Gel in the System n-butyl Alcohol-benzene." (2) Messrs. B. W. Bradford and G. I. Finch, "On the Dielectric Strengths of some Explosive Mixtures containing Carbonic Oxide."
Electrical Association for Women, at the Park Lane Hotel, Piccadilly, W. 11.15 a.m. Annual General Meeting.
At the Institution of Electrical Engineers, Savoy Place, W.C. 8 p.m. Mr. Llewelyn B. Atkinson, "Some Electrical Reminiscences."
Electrical Engineers, Institution of, Savoy Place, W.C. 6 p.m. Annual General Meeting.
At the Physical Laboratory, Trinity College, Dublin. 7.45 p.m. Annual General Meeting.
Linnean Society, Burlington House, W. 5 p.m.
Mining and Metallurgy, Institution of, at Burlington House, W. 5.30 p.m.
University of London, at King's College, Strand, W.C. 5.30 p.m. Mr. I. L. Evans, "The Economic Development of Modern Roumania (1829-1929)." (Lecture III.)
At the London School of Economics, Houghton Street, W.C. 5 p.m. Prof. P. Vaucher, "The Government of Paris."
At the London School of Hygiene and Tropical Medicine, Keppel Street, W.C. 5.30 p.m. Prof. Dr. A. J. Kluyver, "The Chemical Activities of Micro-organisms." (Lecture II.)
At the London School of Medicine for Women, 7 Hunter Street, W.C. 5.30 p.m. Dr. A. Lacassagne, "Treatment of Uterine Cancer by Radiations." (Lecture III.)
At University College, Gower Street, W.C. 2.30 p.m. Prof. Sir F. Petrie, "Recent Discoveries at Beth-Pelet, Palestine."
At University College, Gower Street, W.C. 5 p.m. Dr. Lythgoe, "Special Sense Physiology." (Lecture I.)
At University College, Gower Street, W.C. 5.30 p.m. Prof. F. G. Cole, "The Early History of Generation and Comparative Anatomy." (Lecture IV.)
At University College, Gower Street, W.C. 5.30 p.m. Prof. P. Geyl, "The Foundation of the Kingdom of Belgium in 1830."
- FRIDAY, MAY 16.** Electrical Engineers, Institution of, at the Technical College, Dundee. 7.30 p.m. Mr. R. H. Fowler, "Some Recent Advances in the Electron Theory of Metals." (Kelvin Lecture.)
Royal Institution, 21 Albemarle Street, W. 9 p.m. Dr. C. M. Yonge, "The Great Barrier Reef of Australia."
University of London, at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C. 5.30 p.m. Prof. Dr. A. J. Kluyver, "The Chemical Activities of Micro-organisms." (Lecture III.)
At University College, Gower Street, W.C. 5.30 p.m. Prof. J. H. Morgan, "The Legal and Political Unity of the Empire." (Lecture II.)
- SATURDAY, MAY 17.** Philological Society, at Oxford. 5.30 p.m. Joint Meeting with the Oxford Philological Society.

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No. 4943

FRIDAY, MAY 16th, 1930

VOL. LXXVIII

All Communications for the Society should be addressed to the Secretary, John Street, Adelphi, W.C.2.

NEWS OF THE WEEK

"I never to this day pass a latticed-windowed cottage without wishing to be its cottager, I never yet saw the castle which I envied to its lord; and although in the course of many worshipful pilgrimages I gathered curiously extensive knowledge, both of art and natural scenery, afterwards infinitely useful, it is evident to me in retrospect that my own character and affections were little altered by them; and that the personal feeling and native instinct of me had been fastened, irrevocably, long before, to things modest, humble, and pure in peace, under the low red roofs of Croydon, and by the cress-set rivulets in which the sand danced and minnows darted above the Springs of Wandel."

John Ruskin.

Gloucestershire.—We quote from *The Times* an account of the interesting experiment of a Fellow of the Royal Society of Arts in building Council cottages with his own materials and labour.

The Minister of Health, Mr. Arthur Greenwood, said, "I consider that these cottages will, in the fullness of time, become the soul of the Cotswolds."

The cottages belong to the Witney Rural District Council, but they have been built by Mr. Stafford Cripps, a landowner and resident of the village. When he learnt that the local council proposed to erect four cottages he undertook to build them and provide the accommodation required if the authority would give him the money which they intended to expend on the work. Mr. Cripps stated to-day that he was desirous of preserving the traditional beauty of the Cotswolds, which would be marred by the erection of brick rough-cast cottages of the modern type.

The main walls of the cottages are of local stone. The windows and doors have simple stone dressings, and the roofs are of local stone slates. With a Tudor doorway in the centre of the group and long gardens in front, the cottages are in perfect harmony with their surroundings. Two of the houses have four bedrooms and the other two three bedrooms, and all have a parlour, a kitchen, and a scullery. The total cost was £1,778 2s. 11d., or £444 10s. 9d. a cottage. The work has been carried out by men engaged on Mr. Cripps' estate, with assistance.

The stone used for the cottages has been quarried on Mr. Cripps' estate and has been charged at the actual cost of the quarrying. Mr. Cripps explained that the building has been executed by direct labour and there has been no allowance for contractors' profits.

Much interest was shown by visitors in the bill of costs for the four cottages. It was as follows :—

Wages (including supervision), £741 2s. 1d.; stone and stone tiles, £150 13s. 10d.; materials purchased, £807 17s. 3d.; haulage, £66 14s. 6d.; insurances, £11 15s. 3d. Total, £1,778 2s. 11d. Per cottage, £444 10s. 9d.

A summary of the materials purchased, making the sum of £807 17s. 3d., shown in this bill, contained the following items :—

Bricks, 37,850 at 70s. (less 2½ per cent.), £129 3s. 2d.; timber, £165 18s. 10d.; dressed stone (windows, coyns, &c.), £130 9s. 9d.; cement, 1. 1-3 tons, £44 7s. 4d.; lime, 8 tons 2 cwt. 2 qrs., £15 6s. 1d.; sand, 99 loads at 6s. 6d., £32 10s.; breeze blocks, 300 yards at 3s., £43 17s. 6d.; concrete lintels, at 1s. 4d. foot, £15 9s. 4d.; damp course, £7 19s. 9d.; drain and R. W. goods, £15 19s. 3d.; doors and frames, £33 16s. 6d.; windows, £70; grates, £22; stairs, £21 1s. 3d.; wood block floors, £22 2s. 9d.; sinks and coppers, £6 11s.; gates, £2 4s. 1d.; paints, &c., £4 19s. 2d.; nails, screws, locks, hinges, &c., £8 11s. 8d.; sundries, £15 9s. 10d. Total, £807 17s. 3d.

It is understood that the cost of the four cottages is more than that which would have been spent on the houses which the council proposed to build. But Mr. Cripps stated that the experiment had shown that the work could be carried out at a lower cost, and he presented a statement of estimated savings which would be possible if a similar contract on a larger scale were repeated. This showed a net cost per cottage of £402 3s. 3d., a reduction of £42 7s. 6d. on each house. It was stated that the cottages would probably be let at 6s. per week exclusive of rates.

MR. GREENWOOD'S SPEECH.

Mr. Greenwood, in his speech, said there was now before Parliament a Housing Bill which he hoped would do much to remove the disgrace regarding housing conditions in many of our rural areas. The housing problem was not merely an urban one, it was also a problem of the countryside. There were houses in the Cotswolds with beautiful exteriors, but with interiors which were unworthy of us to-day. A very large number of people working on the land or associated with the land were living under conditions which, in the most moderate language, one could say were unsatisfactory. He hoped it might be possible very shortly, where the conditions were bad, to replace them by something better and to do it in the rural areas with the assistance and cooperation of the county councils.

"But your problem," Mr. Greenwood continued, "is not merely a problem of seeing that people have decent shelters over their heads, important though that may be. It is to do it in such a way that your children will not be ashamed of you. Many of us to-day are ashamed of what the generation before us has done, and what, indeed, people of this generation are doing to defile the countryside." There was a persistent beauty about our countryside. Buildings had been incorporated in the landscape and were as much a part of the countryside as the hills and the valleys with their streams and trees. There was no reason why that should not continue. There was no reason why they should invade the countryside with structures that were foreign to the countryside. He hated to see the sprawling, disorganised development of buildings which were ugly in themselves and formed no part of the countryside on which they had been planted.

Where they had a well-established architectural tradition that had woven itself into the fabric or life of a district there was not much to be gained by imitating some of the dreary streets of London or Birmingham. He was attracted by the traditions of the Cotswolds. They were worth maintaining and preserving. They were in a very intimate way a part of the very lives of the people in the area. He hoped the representatives of public authorities present would find a real interest in the new cottages that had been erected in the village. There was no reason why there should not be more houses of that type. We should never be a self-respecting nation so long as we permitted families to dwell under conditions which were not merely depressing but were unhealthy, demoralising, and soul-destroying.

Battersea.—We gather that no plans have yet been made for the proposed tenements to occupy the site of the Little Manor House, so there is yet time to consider if this can be incorporated in a scheme of housing. Lord Shuttleworth writes as follows to *The Times*, and this appeal from so notable an education authority should surely be very convincing. As the first Training College, it has claims, apart from its satisfying beauty of building :—

THE FIRST TRAINING COLLEGE

TO THE EDITOR OF *THE TIMES*

SIR,—The excellent reasons advanced through your columns for the preservation of the Little Manor House at Battersea have not included an argument which naturally appeals very strongly to me. Ninety years ago my father, Sir James Kay-Shuttleworth (then Dr. Kay), with his mother and sister, went to live in this house to begin the great and successful experiment of giving to pupil-teachers the training and the education which enabled them to become the first certificated teachers in elementary schools. He had just shouldered in 1839, at the Privy Council Office, the heavy task of laying the foundations of our system of popular education. As an Assistant Poor Law Commissioner, he had started in the work-house schools the pupil-teacher system. So that the only pupil-teachers available for this novel experiment began life as pauper boys. They were housed in the upper rooms of the Manor House under his personal supervision. He used to tell me with just pride how not only they became the first trained school-teachers, but how a few of them rose later to positions of even greater responsibility. The heavy cost of this fertile experiment was shared with him by his friend, Mr. E. C. Tufnell, also of the Poor Law Commission.

To each of these two founders of the first training college there are memorial tablets in the Chapel of St. John's College, Battersea, as it came to be called after it passed under the care of the National Society, before its recent merger in St. Mark's College, Chelsea, one of the numerous training colleges which were started on the model of Battersea. These tablets should obviously be carefully preserved either where they are, or at St. Mark's, or in Battersea Parish Church. But what I have said is surely an argument against the destruction of a time-honoured house, whose history and architecture are both of peculiar interest. In the "Life and Work of Sir James Kay-Shuttleworth," by Professor Frank Smith (pp. 104-132), published by John Murray in 1923, are recorded these original and fruitful beginnings at Battersea of our system of training teachers.

Yours faithfully,
SHUTTLEWORTH.

We cannot help also printing a less weighty, but pathetic, appeal for the preservation of this house from Mr. R. Graham, also in *The Times* :—

LITTLE MANOR HOUSE, BATTERSEA

The drab streets of Battersea, created to house factory hands, that were fields when Carlisle lived across the Thames, will lose a rare possession if the Little Manor House perishes. Just now its many windows face the river through the golden and green of fresh budding trees. The old church of St. Mary, on the other side of the road, with the tide washing the walls behind which rest citizens of London, will be deprived also of its really singular dignity, considering the network of dreary streets which press against it. Its picturesque vestry window juts out still to hold the picture of passing barges, peaceful and serene on the high afternoon tide, as a century ago. Inside, the church is full of interesting memorial tablets, to which your correspondents have referred. There are waste spots in Battersea where the much-needed workmen's flats could rise without disturbing this one spot of grace.—MR. R. GRAHAM, 9 Cranbourne Court, S.W. 11.

The Secretary of the Society for the Propagation of Christian Knowledge, who sold the house, reserved the staircase and panelling, but he writes as follows:—

It has been brought to the notice of our Society from various quarters that an effort is being made to persuade the purchasers to preserve the house, and it will be sufficient proof of S.P.C.K., as the vendors, being entirely in accord with that effort if I say that our agents have been instructed to inform the purchasers that, if the house can be preserved, S.P.C.K. will allow them to have the contents on very easy terms.

The house and its contents are a noble architectural unit and it is inconceivable that they can be separated or destroyed. This house must undoubtedly be included in the next Inventory of the Historical Monuments in London, Vol. VI. We are sure that Lord Crawford and Sir George Duckworth will come to the rescue. "The study of old dwellings and churches, of furniture and monuments, together with our own efforts to preserve them for posterity, may perhaps make some contribution towards solving problems of our own day." So speaks Lord Crawford in his "Concluding Survey."

Hadrian's Wall.—We publish a letter addressed to the Secretary of the Society on this subject from a Fellow of the Society who has been very helpful in preservation work in the Shrewsbury district :—

HADRIAN'S WALL

DEAR SIR,

I have read with sympathetic interest the copy in the current issue of the journal of the Society, of a letter published in *The Times* and written by representatives of Shrewsbury School, directing attention to the mischief likely to result from quarrying work near to Hadrian's Wall.

The second letter, by a Shaftesbury writer, evades the obvious fact that there is ample opportunity for developing "useful productive work"—especially stone quarrying—elsewhere, without likelihood of injury to such an historic monument as the Roman Wall, a land-mark which it is our duty to preserve for all time.

There appears to be some confusion between the probable opinions of Shaftesbury and Shrewsbury, in the paragraph which follows, possibly the result of a printer's error.

A few miles from Shrewsbury, on the banks of the Severn, are the fields and village of Wroxeter, covering the site of Viriconium, once the fourth city in size and importance in the Roman province—Britain. During excavations in 1924, by Professor Atkinson, the finest inscription that has been discovered in this country was unearthed. It commemorated the erection of the Forum of the city, four years after the Roman Wall was built, in honour of the Emperor Hadrian, by the "Civitas Cornovii."

The inscription has been re-erected in the Shrewsbury Museum, and replicas are to be seen in Birmingham and the British Museum. We, Shropshire people, are very proud of our Roman "relics," and whilst sympathising, as we all do, with every effort to ameliorate the "tragic social problems" of the times, we do not think that there is good reason for injuring the amenities of historic monuments, whilst ample opportunities for quarrying stone can be found elsewhere.

Yours faithfully,

J. A. MORRIS.

Advertisements.—Messrs. Sissons write as follows :—

We acknowledge receipt of the copy of the *Journal of the Royal Society of Arts*, dated May 2nd last, which you have sent along to us, drawing attention to page 665.

The letter referred to addressed to us by your correspondent is quite fresh in our memory and, candidly, we can see no "sufficient reasons" for the withholding of his name.

Our "Men and Plank" Field signs have been in use now for twenty years and, whilst during that period their number may from time to time have been slightly in excess of what it is now, to-day there are no more than 100 exhibited throughout the whole of the country. They are placed, as doubtless you are fully aware, in fields adjacent to the railway and not on the roads.

Are we correct in assuming that for something like fifteen years there was no suggestion that our signs were a "desecration" or that they despoiled in the slightest the countryside? It is, we believe, something like five years since the present campaign was first started, and we believe we are right in saying that it was influenced largely, if not solely, by the increase in the growth of roadside advertisements and particularly such advertisements as became increasingly common within radius of every half mile reach of country villages.

Your correspondent in his letter to us referred to our "bad taste." Without any spirit of retaliation, we feel constrained to express our opinion that your taste, if not perhaps bad, is questionable, in making the appeal you have in your journal to architects and builders to cease to specify the products of our house or to use them. You say further that "local authorities will lose no time in availing themselves of the power given them to limit the display of unsightly advertisements." Naturally we must assume you are fully aware of the fact that during the whole twenty years that our signs have been displayed they have had to have the authority and approval of the various local authorities where they appear.

In the "list" that you have in course of preparation of the "most conspicuous offenders against the regulations up and down the country . . . who desecrate the approaches to villages and open fields" we assume our name will not appear

for the simple reason that no single one of our signs can be found at the "approaches to villages and open fields."

There is an inference that the "unsightly advertisements on the West Wycombe Railway Station" to which, at the request of many Fellows of the Society, you have called attention, are our advertisements. We cannot trace any previous communication from you on the subject, and if you have written us at any time respecting our signs we should be obliged if you would send us either a copy of such letter, together with a copy of any reply you may have received, or, failing that, a reference for your letter.

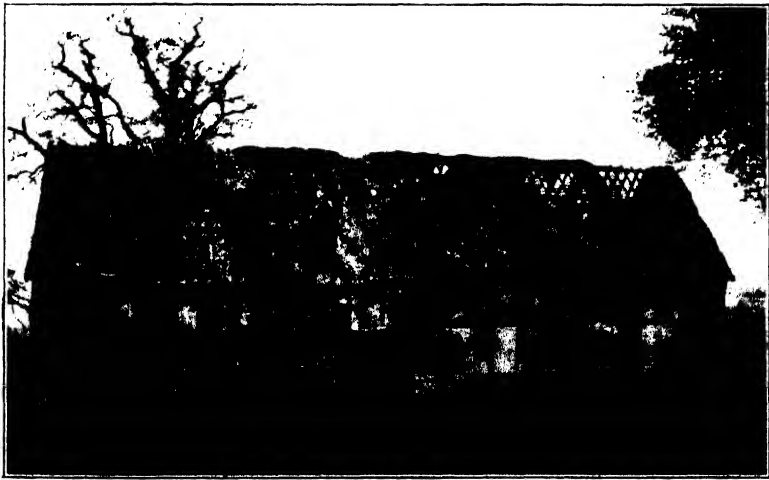
We rather sympathise with Messrs. Sissons, as they are by no means the worst offenders in the display of advertisements. There is indeed a certain rural realism in the particular form they have adopted, and we are glad to note that there are only 100 of these "Men and Plank" advertisements in this country. We have noticed that they are mostly adjacent to the railways. We are sure that Messrs. Sissons will not increase the numbers nor renew the paint thereon in view of the definite legislation now in force.

Guide Books.—Here is a chance for an enterprising publisher—a guide book written by Mr. Hilaire Belloc for every Medieval Town in England. Listen to him in the *New Statesman* :—

"But I maintain that the really good guide-book to any one place has still to be written: I know of none. And I will further maintain that a good series of guide books is *a fortiori* not to be found.

It ought to be produced. I do not say it will be; I doubt whether it will, for it would tell people things that only a minority want to know: the remnant of those who once travelled in Europe with tradition in them. Yet for the sake of that minority, which is much more important than the majority, these books ought to be written. And very careful selection of authorship would it need! The motive that I would set in the forefront of any such authorship is this: to give the meaning of a place, of a fort, of a bridge, of a church, of a city, of a province. Knowledge is knowledge of How and Why. And this is especially true of historical knowledge. And Why should come before How."

Naseby Barn.—An appeal is being made to restore an old Tithe Barn here. It is more than a year ago when we heard that it was in a state of collapse. From the photographs we show it is clear that it is in an almost hopeless state and is ripe for demolition and re-use to make "old-world" houses, to quote the vernacular of the dealers. We are all for its resuscitation, even now, but if the historic associations of Naseby have lost their meaning locally, why should a public appeal be made for such neglect? There are innumerable farms all over England as authentic as this, which are worth preserving, and they should be matters for local enthusiasm and attention. This beautiful piece of authentic building should never have been allowed to get into this hopeless state. We hope that some local Fellow of the Society will make it his business to look into

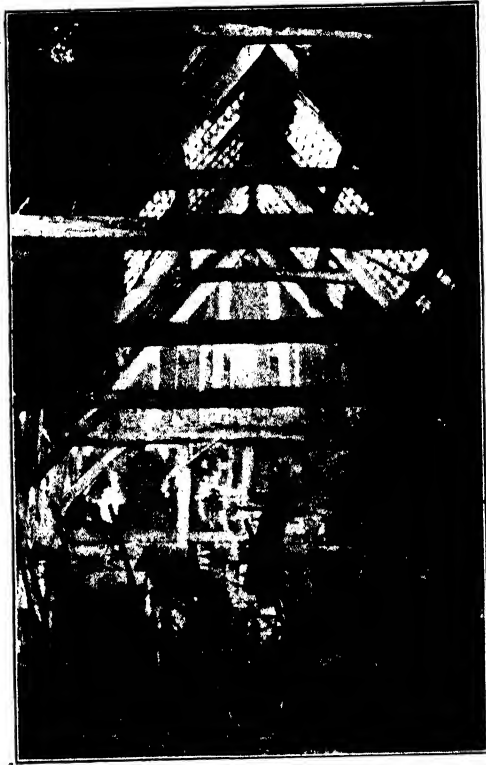


the matter and let us know who owns the Barn. We will gladly advise how best to save it even at this late hour.

We will visit and report more fully on the Naseby Barn. Naseby is historic and its literature is associated in our minds with Fitzgerald's letters, and the correspondence between "Old Fitz" and Carlyle regarding the exact spot of the battle. Here is the letter from Carlyle, which is worth recording :—

"DEAR FITZGERALD,

There is something at once pathetic and ridiculous and altogether miserable and contemptible in the fact you at last announce that by one caprice and another of human folly, perversity and general length of ear, our poor little enterprise is definitely forbidden to us. Alas ! our poor little ' inscription,' so far as I remember



it, was not more criminal than that of a number on a milestone ; in fact, the whole adventure was like that of setting up an authentic milestone in a tract of country (spiritual and physical) mournfully in want of measurement ; that was our highly innocent offer had the unfortunate Rulers of the Element in that quarter been able to perceive it at all ! Well ; since they haven't, one thing at least is clear, that our attempt is finished, and that from this hour we will devoutly give it up. That of shifting the now existing pyramid from Naseby village and rebuilding it on Broadmoor seems to me entirely inadmissible ; and, in fact, unless you yourself resolve—which I don't counsel—on marking, by way of foot-note, on the now existing pyramid, accurately how many yards off and in what direction the real battle ground lies from it, there is nothing visible to me which can without ridiculous impropriety be done.

The trouble and bother you have had with all this, which I know are very great, cannot be repaid you, dear old friend, except by my pious thankfulness, which I can well assure you shall not be wanting. But actual money, much or little, which the surrounding blockheads connected with this matter have first and last cost you, this I do request that you will accurately sum up that I may pay the half of it, as is my clear debt and right. This I do still expect from you ; after which *Finis* upon this matter for ever and a day. . .

Good be ever with you, dear Fitzgerald,

I am and remain Yours truly,

(Signed) T. CARLYLE.

Art.—**THE GOUPIL GALLERY.**—**ERIC KENNINGTON.**—Mr. Eric Kennington is one of those rare people who excels equally as a draughtsman and a sculptor, though, of course, he is chiefly known for his bold memorials and carvings in stone. A good many of the drawings in his present exhibition at the Goupil Gallery are studies for sculpture, but, nevertheless, almost the roughest of them has a rare beauty of line. Some of the war subjects are poignantly dramatic, as No. 6, "Dead Soldier," and 44, "Wounded and Gassed"; they all fit in strangely with what one might almost call the post-war movement which is running through art and literature and drama at the present moment, not to show the glorious victorious thousands as they did ten years ago, but letting us into the horrors behind, the gassed and maimed and the awful waste and drab despair of the front line. Eric Kennington gives us all these, not with blatant ugliness, but with real insight and sympathy.

Bainbridge Copnall, his co-exhibitor, has a magnificently impressive "Praying Figure," which compels admiration by its decorative quality, though it is rather unnecessarily ungainly. His bas-relief "Resurrection" shares the same quality of design and strength, but to give any real opinion on its merits needs more distance than the gallery can give. It is like putting "Rima" in a small drawing room.

TOOTH GALLERIES—PAINTINGS BY RUBIN.—Many visitors to this striking exhibition may not like the paintings, but they cannot fail to be interested, and amazed at this artist's extraordinary originality. Nowadays, when almost every trick of painting is exploited in order to be new and outrageous, it is refreshing to find someone who obviously does not care for tricks or conventions. There is a wonderful feeling for colour and a curious trick of getting a misty background with a sudden strident bit of painting superimposed on it. "Carnations" and "On the Road to Jerusalem" are particularly striking, apart from the vivid views of Palestine.

Farnham.—We have received further correspondence on this matter, including a communication from the Secretary of the Royal Academy. Space does not admit of this important matter being dealt with adequately until next week.

Theatres.—"DOWN OUR STREET," by Ernest George. No better description can be given of this striking play than that given by one of the critics, who alluded to it as an English "Juno and the Paycock"; it has the same faculty for portraying the very soul of the cockney through comedy and tragedy in every changing mood, just as Sean O'Casey did with the Irish in his fine drama. We recommend this play most wholeheartedly to those who really enjoy good writing and acting. Every character is human and splendidly drawn and the cockney humour keeps the audience laughing all the time almost through the tragic scenes, which, nevertheless, are very poignant and magnificently played by Nancy Price, and Morris Harvey, who gives a great performance as her good-for-nothing husband. This play deserves to be a big success.

Books.—"LORD BYRON," by Kasimir Edschmid. This strange novel-biography written by a German comes at a time when Byron is being more read and discussed than he ever has been since his death. It is unkind to any other biographer to mention Maurois' splendid book, but it is almost impossible not to criticise everything else on this subject in the light of its perfection. We are told that this book has made a great sensation in Germany, and it certainly has a sensational quality, but one cannot help thinking that the author has never quite decided whether to write a novel or a biography, and this book has the faults of both, though it is vital and interesting and for students of Byron it throws quite a new light on their hero. In view of the present interest it might be amusing to hear the following opinions which the author transcribes on the title page:—

"The herald of world literature" (*Goethe*).

"He had something in him not only of his friend C., but of his own tame bear" (*English Table-talk*).

"C'est du génie mal logé" (*Stendhal*).

"My friend had faults, but no vices: his virtues were of the highest order" (*Lord Broughton in answer to a Parliamentary attack*).

"Well, he was a fine beast" (*One of his successors in Nice*).

"My digestion is weak: I am too splenetic and live mainly on vegetables" (*Byron himself*).

"A Sybarite" (*Carlyle*).

"His dramas are tedious" (*History of Literature*).

"My beloved, beautiful Byron" (*his Sister*).

Such were diverse opinions of the man who took Europe by storm a hundred years ago.

"ADAMASTOR," by Roy Campbell. This author had prepared us for something striking by his book called "The Flaming Terrapin," which appeared some years ago, but this was rather too unwieldy, and we felt then that he was in the grip of poetic forces which rather overwhelmed him—he was overpowered by his muse. Here his peculiar gift of satire and strength of descriptive verse have become more crystallised and formed and the result is a very unusually forceful and arresting little book, which will interest all those who like individual expression and moments of real dramatic beauty.

NOTICES

TWENTY-FIRST ORDINARY MEETING

WEDNESDAY, MAY 7th, 1930. MAJOR-GENERAL SIR FABIAN WARE, K.C.V.O., K.B.E., C.B., C.M.G., LL.D., in the Chair. A paper on "National Parks" was read by Mr. S. K. RATCLIFFE. The paper and discussion will be published in the *Journal* on June 20th.

INDIAN SECTION

FRIDAY, MAY 9th, 1930. SIR JAMES MACKENNA, C.I.E., in the Chair. A paper on "The Report of the Royal Commission on Indian Agriculture" was read by MR. DAVID CLOUSTON, C.I.E. The paper and discussion will be published in the *Journal* on June 27.

PROCEEDINGS OF THE SOCIETY

TWENTIETH ORDINARY MEETING

WEDNESDAY, 9TH APRIL, 1930.

SIR DANIEL HALL, K.C.B., D.Sc., F.R.S., in the Chair.

THE CHAIRMAN said that the lecturer, who was to speak on "Genetical Methods of Livestock Improvement," was in charge of what he believed was the only institution in Great Britain which dealt with the breeding of the larger domestic animals, with genetics and the general theory of breeding and heredity.

The following paper was then read :—

GENETICAL METHODS OF LIVESTOCK IMPROVEMENT

BY PROFESSOR F. A. E. CREW, M.D., D.Sc., Ph.D.

(*Animal Breeding Research Department, University of Edinburgh*)

During recent years the agricultural community has been asking ceaselessly for immediate help, for subsidies, for import duties and the like, but invariably the Governments have seemed to reply that such pleas are both mistaken and ungrateful, for is it not the case that the State has so endowed and organised agricultural research that the grandchildren of the present generation of agriculturalists must so profit that in their time there will be no problems but only universal agricultural prosperity. But one is not surprised to find that the agriculturalists now living seem to exhibit but slight interest in the social circumstances of the generations yet unborn, or to learn that the remark of a former Minister of Agriculture, when addressing a branch of the National Farmers' Union to the effect that his Government was spending much money on research, evoked derisive laughter.

It would seem at first sight that the agriculturalists are somewhat contemptuous of research. But really this is not so. They laugh, sometimes rather bitterly, because they cannot see how the research schemes organised by the State can possibly remove that which they regard as the root cause of the present calamitous conditions of agriculture, namely, the small or commonly non-existent margin between the cost of production and the price of the produce. They hold the

view that nothing but the immediate increasing of this margin in favour of the producer can save the situation. It is for this reason that agriculturalists receive proposals which in their opinion can have no immediate effect on the producer's margin of profit with but scanty enthusiasm. It has to be recognised that never in all the history of agriculture in this country have the economics of breeding demanded more careful consideration than now ; that with the exception of the sheep alone, costs of production are high and returns are low ; that arable farming is largely being replaced by grazing in order to reduce losses ; that there is a distinct possibility that the sheep markets may become saturated ; that the change in the system of farming may prove to be regrettable from the national standpoint ; that the marketing of cereals will probably remain as unprofitable as it is at present and that the only sound policy for the British farmer would seem to be increased livestock production with the marketing of crops in the form of animal commodities, since, owing to the tastes of the British public, fresh animal products cannot, yet awhile at least, be affected by foreign competition. If, then, the aim of British agriculture is to be the production of standardised and uniform animal commodities, the time has come already for serious thought and action. But it is exceedingly difficult for the hard-pressed agriculturalist to plan for the future whilst the present is so very full of gloom.

This being so, it becomes a matter of some difficulty for one who like myself knows full well that much time is required for the development and democratisation of the results of successful scientific investigation to talk enthusiastically of the benefits conferred upon livestock breeding practice by the science of genetics to a company of men whose anxiety is so profound and whose position is presently so insecure. I must remove all possibilities of misunderstanding by defining my point of view concerning the relation of the professional biologist in the service of the State to those whom he is meant to serve. The scientist is concerned with the disclosure of facts—verifiable scientific facts—and with the search for principle : the practitioner of agriculture is concerned with the weaving of these facts into the warp and woof of agricultural policies. It is for the scientist to advance knowledge ; it is for the agriculturalist to transform knowledge into wise action.

Time was when tradition bequeathed by one generation to another was sufficient to command success in livestock breeding, but discoveries in fields of knowledge seemingly quite remote from farming have made the breeder largely dependent upon information that cannot be acquired on the farm. Nowadays tradition must ever be reviewed and commonly discarded. Advances in our knowledge of the principles of breeding, which are the substance of the science of genetics, have been such that to-day the actual value of a particular system of breeding is to be assessed only by one versed in genetical science, and no breeder can afford, even if he would, to neglect developments in this science, for progress in the techniques of breeding would seem to be possible only through the disclosure of relevant knowledge through scientific investigation and through the democratisation of this knowledge. But livestock breeding is much more than an adventure

in applied genetics. The breeder is primarily a manager of a very complicated business, and it is expected of him that he shall be able to construct his own policy of breeding, to check the costs of production against the prices that he is likely to receive and to organise the application of labour. He must, moreover, be a man of live imagination, possessing the ability to anticipate trends of development and to be alive to the values of the contributions that science has made and is making and to the power that it is placing in his hands. It is far too commonly forgotten that science is of assistance to the breeder only if he knows already the primary business of farming. It can be of help only if he is competent to apply its generalisations to his own particular circumstances. Science can contribute nothing unless the breeder is at all times prepared to jettison the old and to accept the new, to regard no method or system as immutable. It must be understood that no particular method is good in itself, but only in relation to prevailing conditions of markets, climate, soil and so forth, and that the only real test of the value of a method or a policy in breeding is that it shall yield a profit to the breeder in the circumstances under which it is practised. It follows, then, that much more than an understanding of genetical theory and an appreciation of genetical facts is demanded. The science cannot help the man who, through lack of vision or of money, cannot continually seek new methods and new policies, who cannot change his practice when markets change: it cannot help those who keep store cattle so long that they cannot compete in the end with the more suitable class of beef that comes from the cheaper grazing grounds abroad, nor those who breed unsuitable sheep which yield large joints and an abundance of fat, those who sell the quickest growing sows and keep the slowest for further breeding, not knowing that the economical conversion of food into pig is an inherited character and that the quickest growers are the most economical feeders. The geneticist can help the breeder when the latter has stated his policy and has defined, more or less exactly, what he wishes to produce. The geneticist can discuss the methods of production, but the reasons for production fall outside his field.

THE STANDARD OF EXCELLENCE.

A definition of what the breeder wishes to produce leads at once to the construction of standards of excellence and thus to serious difficulty. These standards are necessarily complex, because it is impossible to concentrate on one or two qualities, such as meat or milk or wool production, and to neglect the animal as a whole; the ideal animal must live, thrive and reproduce in a particular environment as well as provide certain animal commodities. Type is meaningless without reference to habitat and destiny. Another difficulty that stands in the way of standard making is that too commonly the general economics of production are complex; for example, the destiny of a mountain breed of sheep may be the production of ewes for crossing with rams of a larger lowland breed in order to produce the best kind of fat lamb. The standard of the mountain breed in a case such as this is applied only to the female, for the function of the male is to

produce females, whilst that of the lowland breed pertains mainly to the ram. Moreover, standards quite commonly cannot be consistent, since it may be impossible to obtain in a single animal the full development of all the desired points of excellence. The standard for males and females may be quite different, so that one flock or herd or strain secures a reputation for producing males of excellent type, whilst its females are not nearly so good. A special example of this is encountered in the cockerel-producing and the pullet-producing strains of such a breed of fowl as the Dark Brahma. Standards present great difficulty in their statement because of their elusive nature. Excellence can as yet be defined only in the vaguest of terms, and all too commonly it does not refer to the realities of structure and function of the animal body, and its analysis in terms of inherited characters is quite impossible. Yet until excellence has been defined and measured, the science of genetics cannot offer much real assistance. Improvement implies an attempted nearer approach to the standard of the ideal. Obviously, therefore, before there can be intelligent attempts at improvement the standard must be defined and must be shown to be biologically and economically sound. But all too commonly the standards are set, not by the breeder, but by the buyer, who knows little, if anything, of breeding. For example, one hears a great deal to-day of the need for improvement of the fleece of the sheep, but the voice one hears is the voice of the manufacturer of textile goods, who apparently regards the sheep merely as a vehicle of a fleece out of which he is destined to manufacture socks and semits at a reasonable profit to himself. But the breeder has quite different standards: to him the fleece is a protective covering for the lamb and for the sheep, contributing to the development of such qualities as hardiness—the fleece must be of such a kind as will help his sheep to thrive, for he has to consider fertility, milk yield, growth rate and fitness in relation to the particular system of husbandry and to the geological and climatic conditions of his farm. The sheepbreeder in this country knows that mutton can always command a fair and steady price in the regional markets, whereas the fluctuations in the price of any particular grade of wool are profound and most unsettling. He therefore regards mutton production as the more important aspect of husbandry and wool merely as a bye-product. Two sets of interests must be considered when drawing up the standard of the ideal, the breeder's and the textile manufacturer's, but of the two the breeder's must remain the more important.

From what has been said, it is seen that the ideal type is that which in virtue of its characterisation so harmonises with the conditions of husbandry that it achieves the fullest expression of its hereditary endowment and so fulfils adequately the destiny for which it was intended. Before any standard of excellence can be intelligently constructed there must be available exact information concerning the purposes for which the stock is to be bred and concerning the habitat in which it is to have its being. When this information has been given it becomes a fairly simple matter to define and to construct the type.

THE BREEDING OF THE IDEAL TYPE.

Breeding is a synthetic operation, and before there can be intelligent controlled synthesis there must be analysis. One of the most urgent demands in animal breeding is the scientific analysis of excellence and a study of the interrelationships of the various characters which in their combination constitute the ideal and of the mode of their inheritance. The methods of improvement, through breeding, are simple and straightforward. Developments in genetical science have not changed them, but have merely refined them and have explained their success. A recognition of the broad fact that the majority of the component characters in any ideal type are dominant in the Mendelian sense and that the majority of undesirable characters are recessive enables us to understand many things; for example, the facts that it is not to be expected that the progeny of a mating shall be of the desired standard unless the parents approach that standard; that the greatest chance of obtaining an individual of excellence is provided when parents, excellent themselves, and related one to the other, are used; that it is not uncommon for good parents to throw bad offspring; that any culling must be carried out as a national scheme since the herd or flock is far too small a unit when uniformity of produce is sought; and that inbreeding can give such diverse results since this system of mating is the quickest means of disclosing the hidden recessives.

There is only one sure way of improving the livestock of a country, and that is by improving the stockbreeder. This can be done by improving his education and by offering rewards for ability. At the present time the shows are not such important agents in livestock improvement as they were in days gone by, for far too much importance is given to standards which have no relation to economic worthiness: the showyard is somewhat blind to commercial realities and tends to encourage grossly uneconomical systems of husbandry. To-day the prize is too commonly given to the man who exhibits the best fitted animal and not to the animal that is the nearest to the ideal economic type. The fact that pedigree as an instrument wherewith to assess worthiness is not enough is not clearly recognised, and the prize is too often given to the best looker and not to the best performer. The milk record, the bacon quality, the pulling power, the egg record, the fertility record must overshadow the preferences of prejudiced judges; judgment must be impersonal and based on a record of performance, on productivity, on thriftiness and resistance to disease before the shows can play their proper rôle in livestock improvement schemes. The milk recording schemes, the pig testing station, the wool yield test, the dynamometer, the laying trial, the premium schemes, which include considerations of fertility ratio and of prepotency, these are instances of the tools wherewith the standards of to-morrow are being fashioned in accordance with genetical fact, these are the instruments which are contributing to the education of the stockbreeder and which are the means by which he may hope to gain adequate rewards for the exhibition of vision and ability.

That which the enlightened individual, Bakewell, the Booths, the Collings, Bates, Cruickshank, Duthie, Watson, McCombie, Price, Hewers, for example, did and which "the white heifer that travelled" and "the Durham ox" did to show what good stock is and how to get it led inevitably to the rise of agricultural societies, the herd and flock book societies, all of them organisations for the protection, the improvement and the advertisement of stock. But the time has come when that which the society cannot do, the State must. Everywhere we see State intervention in the programmes of stock improvement and the genetical methods employed have been of two kinds, negative and positive. The negative comprise all those projects which have for the object the prevention of the spread of bad germ plasm among the livestock population of the country. There are in this country vast numbers of inferior animals differing from the superior in virtue of their hereditary constitution. Their characterisation is not hopelessly bad, but it is not so good as that of the others. Since manifestly it is sound policy to breed only from the best there is no point in propagating the relatively unsatisfactory. Further, since improvement implies the manipulation of hereditary constitutions it is eminently desirable that the pedigrees and performance records of all animals used for breeding shall be known. For this reason the use of the scrub bull—the unknown—must be discouraged and even prevented.

But besides the relatively inferior there are considerable numbers of animals in the livestock population of this country that carry in their hereditary constitutions factors corresponding to characters which are harmful to their exhibitors and which cannot easily be repaired. Lethal factors which lead to the development of characterisations that render their exhibitors non-viable are widespread and are responsible for much pre-natal and early post-natal death. Hereditary defects and derangements are common and can presently be removed only by the removal, by genetical methods of breeding, of the individuals carrying the factors corresponding to them. Possibly dominant lethals exist, but if so, then the individuals carrying factors for them die at a very early stage of development. Those that are recognised are recessives and in the simplex condition affect the viability of the individual either not at all or else but slightly, but cause death when present in the duplex condition. It is because such lethal recessives are fairly common that inbreeding is so dangerous. If the lethal character is expressed in the heterozygous condition its presence in the hereditary constitution of a stock can be recognised, but if it produces no visible effect when heterozygous, then its presence can be deduced indirectly by observing the absence of certain expected types among the offspring of a mating or by noting the occurrence of still births. Examples of the first group which produce a visible effect when in the heterozygous condition are the dominant yellow colour in the mouse, the hooding character in the canary and the bulldog calf. The occurrence of still-births must always arouse the suspicion that a recessive lethal factor is at work

and that this in the duplex state renders the individual non-viable. An excellent example of this is the case of atresia coli in the horse.

The problem of lethal factors links up with that of the record of performance. Ideally it is very desirable to test every stud animal for the presence of sublethal factors, and so only those sires which, when mated with their daughters, have produced a run of twenty normal offspring (of satisfactory performance) should be recognised for breeding purposes. Of course, such advice cannot be followed by the individual breeder, but the time will come, no doubt, when all uncastrated male domesticated animals of economic importance will be purchased by the State at killing price and kept alive until they have been thoroughly exposed to the progeny test. The State cannot afford to allow the sires to remain in private hands.

Positive methods of livestock improvement aim at the provision of stock of known genetic constitution and possessing an accurate record of performance. Such schemes necessarily involve considerable genetical analysis of standards and of stock. Most, if not all, premium schemes thus far developed possess little, if any, value, for the reason that no sufficiently comprehensive records have been maintained. Nor can they ever be until all licensed sires become the property of the State and the experimental material of the scientist. All State intervention of this kind assumes that breeders generally are either incapable of assessing the real value of an individual or individuals at all accurately, or else cannot, for financial reasons, provide suitable sires for themselves. This attitude is amply justified, for there is no indication that there has been any rapid multiplication of the very good animals, and a corresponding reduction in the number of the inferior animals in the livestock population in this country. The general level of excellence of the commercial stock of this country is pitifully low. One of the most urgent tasks to be undertaken is the remedying of this state of things. The very first step to be taken is the breeding of pedigree stock according to genetically approved systems of breeding. The next step is to grade up commercial stocks by means of pedigreed sires and to produce first crosses for certain commercial purposes by the use of two pure-bred stocks. It is highly probable that for the special purpose of meat production the first cross will always be used. But the production of the first cross with its hybrid vigour depends entirely on the pre-existence of two complementary or compensatory types of pure bred and the success which now attends, and will attend, this system of breeding depends entirely upon the existence and maintenance of pure-bred stocks that can be crossed with advantage. The uniformity of excellence of the first cross is determined by the genetic purity of the parental stocks. In this production of first crosses of exceptional economic worth, large numbers of pure-bred stock of the highest quality are needed. These latter are also absolutely necessary for the most important yet simple task of grading up the pure-bred commercial stock of the country. It would seem to be the case, moreover, that in those instances in which the desired production depends on an intensive degree of

development of relatively simple single functions, such as milk or wool production, the pure-bred is better than the first cross, and so for these purposes great numbers of graded pure-bred commercial animals are required.

It is accepted that every possible economy in agricultural practice must be effected. Yet one does not have to travel far to find extravagances, probably preventable. For example, there is reason to think that the average life of a dairy cow is not more than three lactations, that one-quarter of the dairy cow population of Scotland is replaced annually, that 40-50 per cent. of all mares put to the stallion each year fail to produce a foal. Surely these are matters of grave concern, for it has to be recognised that in all probability half this trouble is genetic in origin. At the present time we do not know what are the causes of this disposal of dairy cows before the reproductive phase of their life history is passed, but we may assume that 20 per cent. or more are disposed of because they have proved themselves to be genetically inferior animals. There is reason to hold the view that about 50 per cent. of infertile matings are due to genetic causes. It is known that defects and derangements of the reproductive system are inherited characters. Studies of the available records have shown that those stallions which have left but few foals, even though they themselves were from prolific sires, usually can claim relationship on the dam's side with individuals of low fertility. There is no doubt that low fertility, sterility, can be bred into a stock and that it is the soundest of policies to breed for fertility at the same time as one is selecting for other qualities of economic worth. The time must come when some standard of merit based on breeding record for mares, both in the show ring and in the stud book will be required. Regularity in breeding will be regarded as a highly-prized character, and the buyer will then be able to assess the fertility of the stock he buys and the menace of sterility will have been removed.

Breeding is the solid foundation upon which all schemes of improvement must be built; expert husbandry can do much, but it cannot transform the hereditarily deficient into highly productive stock. The need for improving quality and for lowering costs of production is pressing. It can be met very largely by breeding for increased productivity in order to lower costs of production and by breeding for quality in order to increase returns. For milk production the first essential is to have high producers, to choose a bull on his dam's record and not upon the record of his sire's dam, to discard low producers and their progeny and to attempt to raise the level of production of the high producers by selection and careful breeding. There will be no problem of surplus milk if the low producers are eliminated and the average yield thereby improved. It is not generally recognised that one cow yielding 1,000 gallons is as profitable to her owner as are five, each of which produce but 650 gallons per lactation. Improvement in beef production is not so simple a matter for the dairy industry is responsible for the presence of great numbers of unsatisfactory stores. But the use of a good beef type sire for the unwanted calf of the dairy cow would do much to relieve the situation. It is in this connection that the scrub bull is at present

so serious a menace. In the case of the pig, present-day opinion is definitely wrong in that it is commonly held that feeding and general management are the all-important factors in the attainment of success. This is not the case, as the records of any pig-testing station will show. Breeding (the hereditary constitution) affects the economics of commercial pig production in that prolificacy, economical conversion of food into pig, early maturity and the quality of the finished commodity are certainly inherited characters.

These, then, are some of the problems which have to be investigated and solved by breeder and geneticist working in harmonious collaboration—the definition of standards, the analysis of excellence, the purification of stocks, the removal of the menace of sterility. The geneticist is completely ready to place his specialist knowledge of the fact and of method at the service of the industry, but the agriculturalist is not yet ready to take advantage of the proffered help. Before this can become really effective, there must be new attitudes exhibited; the breed societies must begin to think nationally as well as scientifically, standards must be modified, stud, herd and flock records must be far more comprehensive and must include the worst as well as the best, for failures are as important as successes in genetical analysis. It will be regrettable if the practitioner turns to the science only when forced to do so by financial anxiety, for science can give the joy of understanding and the thrill of power, which are contributions no less valuable than those which pertain to the materialities of existence.

THE FUTURE.

Though it is unwise to prophesy, it is permitted to exhibit reasonable expectation. During recent years work in the field of endocrinology has been exceedingly active, and to-day we are in possession of a great body of scientific fact which bears very directly indeed upon the problems of livestock breeding. If we examine these problems, we find that they refer to the phenomena of growth, fecundity, fertility, lactation and metabolic rate. It is in respect of these that the good type differs from the bad. Moreover, it is differences in the rate of growth, ultimate body size, the degree of fertility, the duration and intensity of lactation and in the level of metabolism that distinguish the present-day domestic stock from their wild progenitors. Now it is established beyond all doubt that differences in these characters are directly referable to the action of certain endocrine glands, especially to that of the pituitary. We know that the elaborated products of this gland determine the rate of growth and the limit of growth, the number of eggs available for fertilisation, the intensity and duration of lactation and the intensity of the metabolism, and, also, working through the thyroid and the sex glands, the local deposition of fat. It would seem, then, that what artificial selection and controlled breeding have done has been to isolate and develop strains of animals remarkable for certain types of pituitary, thyroid and sex gland functioning. Reference to the various types of man produced by the various kinds and grades of disorder of these ductless glands will reveal every

type of domestic animal of economic importance. That which is abnormal in man is the standard of the ideal among his animals. If this is so, we may assume with confidence that the future will see a very widespread application of the facts of endocrinology to the problems of animal breeding. That which presently is attained only by the exceedingly slow process of selective breeding will be achieved in each generation by the administration of the appropriate endocrine product prepared by the biochemist. The rate of growth, for example, will be controlled by the administration of the appropriate pituitary preparation; other preparations will be used to control fertility, fat deposition and so forth, and then the breeder will not depend for success upon his incomplete control of the somewhat blind forces of Nature, but will have the power to do whatever he will through his ability to supply to the animal those substances which control all those vital processes which are concerned in the development of qualities of economic worth. The lag between demonstrated scientific fact and its incorporation into practice is usually about 20 to 50 years. All these things can be done at the present time in the case of animals of no economic importance, such as the rat and the mouse. Surely, in this country, there must be those who would wish to see this work extended without delay to the horse, the cow, the sheep and the pig. But the fact is that there is no research institution in this country that is in a position to undertake such work, nor will there be until the livestock industry becomes aware of the promise that this work offers and demands that those scientists who are enrolled in its service shall be provided with the means to work with the animals of the farm and not solely with animals that the livestock-breeders would call vermin.

DISCUSSION

THE CHAIRMAN said he was bound to utter a mild protest against the lecturer's statement that farmers had better turn over to stock and consider only that in future, for he held that arable farming as it existed in this country, with suitable modifications, would hold its own. When one considered at what rate the suggested changes of methods could be brought about he felt he had rather more hopes of the arable farmer than of the stock farmer. When the points put before the meeting by Professor Crew were carefully considered it would be seen that the spread of knowledge and the adoption of scientific method would lead an assault against the oldest and most impregnable fortress of British farming.

Historically we in this country prided ourselves on our knowledge of stock and stock-breeding. It was in this country that the principles of selection and pure-line breeding were first of all laid down, and they led to the foundation of those breeds of cattle and sheep and horses which had gone all round the world. In consequence the belief of the British stock-keepers in themselves and their methods had been very strongly verified. However, some of those who looked at these things a little bit from the outside were beginning to think that in this country pedigree had become a fetish and was doing harm when it ought to be doing good. Breeds were being created, established and run entirely for their own sake as breeds and not for the economic values that might result from this pure breeding. In the accepted types

of live stock breeding points were established, and as it were consecrated, by the Royal and other Agricultural Societies, with their show organizations—as ends in themselves. In consequence there was at the present time an almost entire loss among what might be called the official stockbreeders of the country of an economic outlook, and the stock business was dominated by a form of social competition. It was a fine thing to win a prize for this or that kind of sheep or cattle at the Royal Agricultural Society, and men were prepared to pay very big money in order to find their place in the prize list, but what this had to do with the farmer or with the economic production of meat or milk or wool everybody seemed to have forgotten.

He did not think the lecturer had been violent enough in speaking of the danger that was falling upon us through our pride of race and of what we had done in the way of livestock breeding, and our refusal to look at the lessons of the scientific breeder and of the economist who summed up his ledger and his profit-and-loss. Suppose one wanted a bull. The prize-winning records and the pedigree were always given; those were its advertisement. But the wise man looked at the herd book for many generations for a very different purpose; he wanted to know how many calves in that one family there had been in five years. He wanted to know, if he could deduce from the studbook, what had been the prolificacy of the family, which was a thing of fundamental value for the breeder. It was the same in regard to constitution. Every fancier knew when dealing with plants or animals certain families which threw up magnificent things on the show bench; but, as the old Eastern king said, "My children are few but they are lions." These prize winners often occurred in an inherently weak race, and they should be spotted with a view to their elimination.

The evil about stockbreeding as it was at present carried on was the lack of experimental verification, not only of things like prolificacy and constitution but of some of the dogmas and maxims that a breeder had most at heart. Suppose they went out among the breeders of Shire horses. One of the things they were called upon to admire and look at as a breed point, which was a matter of especial pride to the stud groom, who had so much to say in the breeding of these horses, was the hair—"This magnificent hair." Of course, from the practical, workaday point of view of the horse that hair was nothing but a nuisance and a source of possible expense and disease, but they were told that this hair was correlated with the bone and was a sign of vigour, and therefore Shire horses with a kind of feather-brush all round their feet were getting the prize-money. He did not say it was not so; it might be perfectly true, for they must never forget that the observation of the fancier and the breeder might be founded on more than they were aware of; but had they any experimental verification of the theory that one could not get bone and vigour of constitution unless one had this great development of hair about the feet?

There were many other things in the same way. The lecturer, for instance, mentioned the question of the conflict between the breeder and the wool-buyer about the constitution of the fleece. It was known that the breeder of mountain sheep demanded kemp rather than wool, because he said those rams that had a lot of kemp in the fleece were the rams which had constitution and could stand up against the cold and wet of the hillside. Did anyone know? He did not say the breeder was not correct. Again it was the fruit of observation, perhaps; but it was quite possible that he was simply utilizing a kind of anthropomorphic idea that, because kemp looked good, tough stuff, it conferred on the animal the power of resisting cold in the young state. He knew that experimental work had been started, with Professor Crew in charge of it, on that very point; but it was necessary to get experimental verification for many of the most cherished beliefs of the practical breeder. There were so often analogies which worked disaster.

He would give another practical illustration. The breeders of Hampshire sheep were all out for early maturity as the characteristic of the breed, and in consequence, in order to show early maturity and bring out the points of early maturity, the shows and the ram sales took place at a very early day in the history of the sheep. Sheep which were bred about the New Year come to the ram sales and the shows in July and early August, when the lambs are barely seven months old, and one naturally enough got the idea that the animal which could grow to the finest type in seven months was the animal to breed from. It was a good, sound idea, and it had brought about the early maturing power in the Hampshires. But then by false analogy the Hampshire breeder said: "If I want these early maturing things I must have only a young ram and must only breed from a ram lamb;" and what was the consequence? A Hampshire ram lamb in the front flight might sell for 300 guineas, or let for anything from 250 to 300 guineas a season when a lamb, but in the following year his price would drop to £20. Now, genetically speaking, he was the same animal and must produce exactly the same kind of stock, yet by this kind of false analogy, lacking any experimental verification whatever, there was this extraordinary difference in the valuation the practical man attached to the animal. Let them think of all the other consequences that had followed upon this one-sided selection. Probably of all recognised breeds of our sheep the Hampshire was the least prolific. Why? Because they were selected at seven months old. If one selected the animal at seven months one was sure to pick the singles and never a twin, and for generations and generations the Hampshire had been selected for singles, till twin production had been pretty well bred out. It was a very good Hampshire flock that would give an average of a lamb to a ewe, and yet when they turned to other breeds, for instance, the cross-breeds, the first crosses between the Border Leicesters and the Cheviots, they would get 150 or 170 or even 180 per cent.

He would not enlarge upon this subject, but shows and show systems had got to be revised.

The lecturer had referred to the desirability of sires being tested for their progeny before they were brought into use. As far as he knew this was unknown in the British shows; but in Sweden and Norway one would find classes for the bull with his four daughters, and the milk records of those daughters were taken into account. The judging was not merely upon the appearance of the animals but upon their record of performance, and the prize was awarded on that.

Of course, there were conflicting interests all the time. There was the scrub bull to which the lecturer had alluded. He (the Chairman) remembered only too well when he was at the Ministry and was concerned in trying to promote legislation for the elimination of scrub bulls, that this was defeated by the opposition of the dairy interest, for they wanted their cows got into calf but that the calf should be as small as possible. They were so strong a section of the community that there interest was allowed to outweigh the general interests of stockbreeding in the country.

The lecturer had referred to three lactations as the dairy life of the cow. That was brought about, he thought, not by disease factors coming in but by the utter refusal of the dairy owner, in districts like Lancashire and Yorkshire, to breed at all. He was close to a magnificent breeding area for dairy cows, and could draw in good cows for milk. There was an immense wastage of the finest type of cows in that way.

What was the remedy for it all? Professor Crew had suggested the intervention of the State, and that might come, but he would suggest more and more education as a preliminary stage. Let them get their stockkeepers imbued with the general principles of the fundamental sciences and able to take notice of the guidance and apply the methods which Professor Crew and his colleagues could give them.

MAJOR JERVOISE remarked that he had a ram which had been operated on by the system mentioned by the lecturer, and it gave great amusement when the committee went through and found an eight or nine years ram used.

MR. JAMES MACKINTOSH (National Institute for Research in Dairying, Reading) said he felt a certain amount of trepidation because Professor Crew had been speaking mainly from the genetical standpoint. But he could not but be primarily interested in trying to learn about the practice of stockbreeding. The lecturer had made one or two remarks about which he would like to ask questions. When referring to the slides showing the occurrence of lethal factors, which were very interesting, Professor Crew had said, he understood, that they were comparatively common. He would have thought they were very uncommon indeed, with the possible exception of one breed of cattle. In the majority of the breeds of British cattle these occurrences were found very rarely. Could the lecturer make the point clearer, and perhaps give some percentages of cases, if there were any in his possession?

Reference had been made to a comparatively low standard in British livestock, but on the whole it seemed to him difficult to make a statement of that kind, for in most breeds there was a great variety and there were good and bad and medium qualities. To make the statement that we had a large number of inferior animals it seemed necessary to have standards by which to judge and he understood Professor Crew to say that such standards were lacking. He would like the societies to have a more definite standard of the type of animals which were the best. He felt he must stand up for those who were interested in breeding dairy cattle. The Chairman had referred to show standards and their non-practical nature. He agreed, but he thought that section of the farming industry which was interested in milk production had progressed further towards more useful standards than anything the Chairman had said would lead the audience to believe. In many dairy breeds there was an advanced register, qualification for which was a minimum milk yield in respect of cows and for bulls the possession of so many daughters which had attained the standard. They had at the London dairy show a rule that every cow exhibited must have had a certain yield of milk. They had in a majority of counties herd competitions where all the stock owned by the competitors were judged at the farm; it was not a question of selecting one animal and sending it to the show but of judging all the animals on the farm. They had also the judging of bulls and their progeny. The question of the improvement of dairy cows was being taken up with great interest everywhere. With these points in mind he would suggest that at any rate the dairying interest did not merit some of the adverse criticism passed by the Chairman.

MR. W. ROGERS said he should go away dazed, for it seemed a very slow game. Perhaps one's great-great-grandchildren would know something about this business. He suggested to the lecturer that perhaps their breeding of animals to-day was—he would not say unnatural, but not so natural as it used to be. He supposed in the days of the wild boar and sow, the sow bred once a year; and the cow bred once a year. In the present unnatural days one did not think the sow was paying her way unless she had two litters a year at least, and the same with the cow, who must produce much more milk than before.

He remembered going a few years ago to the dispersal sale of a noted South Down flock, and the auctioneer made the remark that the flock was going down because they had lost the shepherd. There was more in feeding for producing good animals than they sometimes thought. It depended on the feeder, not only in the show ring

but in the general utility of the flock and herd. He would like the lecturer to give some information as to the right kind of feeding. He was told quite seriously by a scientific gentleman recently that he could double the fecundity of his pigs by using the right vitamins, and the same gentleman also spoke of right feeding giving 100 per cent. fertility in his poultry in the matter of eggs. He felt that feeding practice must go with this genetical theory, which was tremendously interesting but was very slow.

In breeding shire horses one great trouble was a disease known as joint ill. Was there any solution for that trouble, so that they could assure a healthy foal?

MR. URQUHART RAMSAY (Victoria, Australia) expressed his thanks to Professor Crew for his interesting lecture, and to the Chairman for his remarks. Professor Crew at the beginning said the improvement in stock must come mainly through the improvement of stock-breeders, and that seemed quite sound; but he went on to make out that they were to be in the hands of those who would give them gland products. There were many freaks in stock, in his own country as well as in England; much attention was given to the production of freak types, but there was too much neglect of economic points.

THE LECTURER, in reply, said it certainly was his opinion that arable farming was not as bright in its prospects as stock farming, but it was only an opinion and he was perfectly willing to withdraw it and replace it by another if good grounds could be shown. He had been glad to hear from Major Jervoise that an operation had been successful. There was no reason why it should not be, but one wanted to know the ultimate effects upon the individual and upon the product. Was it a sound agricultural practice? He doubted it, in this country. In the case of cattle one had contemplated the practice, but the difficulty was in the animals getting so heavy.

He was delighted to be criticised so lucidly in regard to lethals and the frequency of their incidence in domestic stock. He and his critic were both right, because if there was a genetic explanation of lethals then it should be the simplest thing, by adopting intelligent methods of breeding, to build up a herd. For reasons that were feasible to the breeder a herd of that kind could not be built up, for one would be selecting for many things: productivity, for instance, and one could not get productivity if something was missing. Therefore, it was not to be wondered at if he said, looking at all domestic animals, that lethals were common, though in the critic's experience they were rare. He agreed that in a flock of the first class there were not any, but for the whole country he could produce figures which would be convincing.

He had thought he was careful to make the point that the dairy breeder had set the pace to other breeders in this country. The register had had more to do with dairy improvement than any other thing. Mr. Rogers had raised the very fascinating problem in biology of the unnaturalness of husbandry and its effects. It was difficult to understand what should be meant by "natural" in the sense referred to. It seemed to him that the living individual was marvellously plastic. After all, the animal they thought of buying was not the animal that had been living on the Steppes. For generations types had been selected, types to which the open plain would be unnatural. He found no difficulty in assuming that one's environment and system of husbandry were the natural environment for the animal.

He agreed that more could be done by improvement in feeding and development in scientific knowledge as to what was the best food; but that was outside his theme that evening. He knew only about as much concerning it as the practical breeder knew, but one could not really know much about animals unless one kept them.

A question was asked about joint ill. If the records kept by the veterinary surgeon were studied they would indicate to a man like himself that the disease was of hereditary transmission. But that was not enough. One must know the conditions under which the individual had its being, and so forth. But the records certainly seemed to indicate hereditary transmission.

On the proposition of the Chairman the thanks of the meeting were accorded to Professor Crew for his paper.

MR. T. B. SILCOCK, Member of the Council of the Royal Agricultural Society writes :—

Many thanks for the proof of Professor Crew's paper, a most interesting contribution with which every one must agree, more particularly with that part where he states that the basis of all progress in the future lies with the improvement of education in the farming community. In connection with this I would like to suggest that more attention might be paid to milk recording, inasmuch as the man who records begins to realise his need of knowledge, and is more susceptible to new ideas than one who does not ; and, although one agrees, theoretically, with the idea of putting the whole of the sires of the country under Government control, I feel, in view of the character of the individual, that this is a matter for some generations hence. But if the Government would subsidise fully the milk recording movement, and, possibly, other movements of a similar nature, they would advance the education of the farmer much more quickly than by any other method.

With regard to Professor Crew's criticism in connection with the life of dairy cows being about three lactations ; here again there can be little doubt that he is erring on the generous side. There may have been an economic reason for this curtailment of the life of a dairy cow, especially when it is remembered that probably the reason for it was because of the lack of mineral content of the dairy cow's food in the old days, and a consequent draining of her system, making her more susceptible to disease. Now, however, that minerals have been introduced, and, recently, the introduction of vitamin D in connection with the minerals, may we not look for an increased length of usefulness in the dairy cow ?

WEDGWOOD'S BUSTS IN BLACK BASALT

"Black Basaltes," wrote Wedgwood in the *Advertisement* prefixed to the Sale Catalogue of his stock issued on December 3rd, 1781, after his partner, Bentley's, death, "is a *fine black* Porcelain, serving as a touchstone for Metals, striking Fire with Steel, bearing to be made red hot in a Furnace without injury ; admitting of a Polish equal to the native Stone ; and like that, resisting the strongest Acids." Such a material little needed the bronzing sometimes applied to it, which was apt to wear off and leave a patchy effect ; for it was in itself entirely suitable to the purpose to which it was applied, the production, namely, of portraits suitable for the adornment of libraries and (when made on a small scale) of mantelpieces. That the works were appreciated is evident from the single fact that Gibbon ordered a set of fourteen for the bookcases of his library at Lausanne—the Marcus Brutus, indeed, is said to have been modelled for him on the largest scale (*i.e.*,

25½ inches high) in 1779; small wonder that lesser men were ready not with purchase-money only, but with suggestions for fresh subjects, not all of them, one fears, too profitable.

It was only when Josiah Wedgwood's correspondence with his friend Bentley was printed in 1928 that his personal share in the busts, which he seems to have regarded with unusual pride, became apparent; only a series of quotations from these privately printed volumes, therefore, can do justice to the subject. No class of Wedgwood's work is more familiar than the medallion portraits, ancient and modern, on which he lavished so much care; but in the busts, which were especially suited to the type of bookcase and mantelpiece then in fashion, he beheld his opportunity for a series of what he called, as we shall see, the finest heads in the world.

The idea of commemorative portraits for such purposes was, of course, not new. Mrs. Delany mentions her husband's purchase of some in Dublin in 1753; Shenstone's circle was alive to their interest; it was Wedgwood's merit to see that such ornaments deserved a more permanent form than plaster, and once he had conceived the idea of using his improved black basalt for the purpose—stimulated perhaps by the marbles executed by Roubiliac and others for the libraries of Trinity College, Cambridge, and Trinity College, Dublin—the scheme was not suffered to languish. But it was not public bodies only that required such things. Rysbrack had produced over a score of miscellaneous historical portraits in terra cotta before 1730; in 1738 Vertue saw another series, afterwards largely added to, in Roubiliac's studio; Scheemaker had executed busts of Shakespeare, Milton, Dryden, and many others; in Wedgwood's own day, Wilton's Cromwell and other historical portraits attracted much notice; and it is significant that practically every sculptor, from Scheemaker to Nollekeus, did his own type of Newton. Wedgwood was, therefore, following a fashion, not creating one; but, as we shall see, his work in that field was well done and well worth doing.

Fresh uses for his new material were obviously suggesting themselves from time to time. In a letter to Bentley, dated November 6th, 1768, he speaks of a "vision by night of some new Vases, Tablets, etc., with which articles we shall certainly serve the *whole World*"; in June, 1769, he was complaining that certain other vases "look so poultry compared with the black," but it is not till 1771 that we find him eager "to keep one hand constantly at Busts if you could dispose of them," and dilating on the desirability of borrowing the "divine Busts"—unfortunately unspecified—in the possession of the Marquis of Rockingham, in order to have "a working model" produced for use at Burslem, from which casts could be taken, and the basalt busts produced and finished by hand. "This long process," he says, "makes them come so dear"; but dear is a relative term, and when we find that the bust of Ben Johnson was priced at two or five guineas, according to size, we shall hardly echo his complaint.

"The Black is sterling and will last for ever," he wrote exultantly in March, 1774; and on June 24th, he gives the first known list: "I had no idea of our



FIG. 1.—Matthew Prior.



FIG. 2.—Bust of Ben Johnson, Victoria and Albert Museum.
Reproduced by permission of the Director and Secretary.

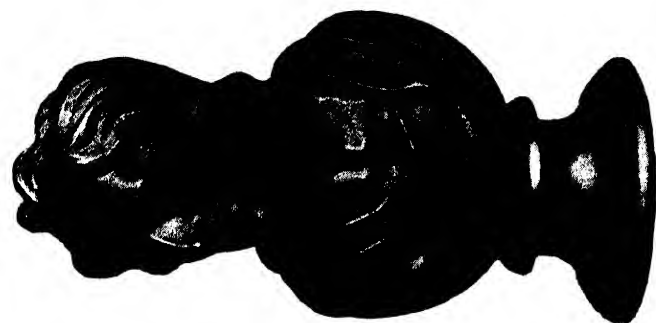


FIG. 3.—Bust of John Locke, by adapted from an earlier bust by J. M. Rysbrack.

Reproduced from "Chinese Porcelain and Wedgwood Pottery," by R. L. Hobson (Lady Lever Art Gallery Collections II) by permission of Messrs. B. T. Batsford, Ltd.

having ordered so many Busts from Oliver and Hoskins. The Heads are—Homer, large and small—Solon, who also had to serve as a Demosthenes (letter of May 7th, 1777)—Pindar—Plato—Epicurus—Zeno—Menerva (sic)—Venus—Palladio—Unknown large head—Inigo Jones—Aggripina (sic)—Seneca—Antinous—Faustina—Augustus Cesar—Antoninus Pius—Marcus Aurelius—Germanicus—Cato.” The Ancients had the best of it at first, therefore ; but of all this list, only the Homer (large and small), the Zeno (V. & A.), the so-called Seneca (V. & A.), and the Marcus Aurelius seem to be in public collections, the one Antinous which I have traced being, like its companion Heroditus, in white jasper. In September, Wedgwood says that “ it will take Hackwood a year or two’s work before our collection is tolerably complete,” though, as he is himself “ much set upon having it so,” he hopes in time to send Bentley “ a collection of the finest Heads in the World.” He has been much encouraged by the fact that “ the great Mr. Brown (*i.e.*, Capability Brown), speaking of himself as an Architect ” was much interested, and decided “ to recommend them at Claremont.”

In 1776 he records, without specifying them, the addition of “ a few heads which we had not before,” and on November 30th was thanking Elers for “ valuable hints for the extension of our Manufacture, in making the Portraits of Eminent Men, both Ancient and Modern.” A month later “ Bustos as large as Life ” of George III, King William and Henri IV, were ordered by an Irish patron, who was sure that they would sell well in Dublin ; and by November, 1778, 105 had, in fact, been ordered by the Dublin agent. “ Peter the Great shall be considered,” we are told ; but there is no evidence that this idea was ever carried out.

In November, 1777, Hackwood is recorded to have “ had a Garrick and Shakespeare upon the stocks several months ” ; but in December, when they were finished, Wedgwood protested against the modeller having signed them under the shoulder : the firm’s name alone ought, he considered, to appear on their productions. In August, 1778, comes the most amusing touch in the whole correspondence : “ Voltaire was made in black before we received your last order. The Clergy will buy him in that color, and we will make him in white for the Laity.” No white Voltaire, however, seems to be on record ; the black Voltaire held the field to the last for clergy and laity alike.

In 1778, an unknown Algernon Sidney and “ the head of one Mr. Bentley Al antique ” are added, although examples seem not to be on record ; and in 1779, after hearing an agent of his say that “ he could sell thousands of Keppels at any price ”—in consequence of the court martial scandals of 1778, that is, when Keppel was a popular hero—Wedgwood breaks into a *cri du cœur* : “ Oh, Keppel—Keppel, why will not you send me a Keppel. I am persuaded if we had had our wits about us as we ought to have had 2 or 3 months since, we might have sold £1000 worth of this gentleman’s head in various ways.” Did the white-glazed Admiral Duncan, of which there is a copy in the Victoria and Albert have a like success in after days ?

In September, 1779, we hear of a bust of Boyle "in the style of Mr. Banks," *i.e.*, Thomas Banks, R.A., and one of Bacon; but the difficulty, as Wedgwood saw, was that "Bacon would not be known without his *English ruff*," and yet he had to pair with "Boyle al antique" (sic). The Boyle I have never seen, but there is a copy of the Bacon at the Victoria and Albert Museum.

The Catalogue of 1773, reprinted by Miss Meteyard, contains relatively few busts; the Sale Catalogue of 1781, however, enumerates a much larger number—possibly Gibbon's order had given a fillip to the industry; the most complete list is to be found in the catalogue of 1787, and there are a few later works, the famous Washington included.

It is well to deal with the Sale Catalogue first, not at length, which would involve mere repetition, but as it throws light upon the whole subject. First of all, we learn that the busts were often sold as pairs, as Shakespeare and Garrick, Newton and Boyle, Hippocrates and Galen, Pindar and Homer, Voltaire and Montesquieu, Voltaire and Rousseau, Seneca and Cicero, Chaucer and Prior (Fig. 1), Beaumont and Fletcher. Sometimes, we find a suite of three, five or seven Ornaments for a Chimney Piece grouped together, with two or three busts among a set of vases. But in dealing with this Catalogue, one must always remember that because a lot was sold together, it does not follow that the auctioneer's grouping was intelligent. Johnson (Ben apparently, not Samuel), a Madona (sic) and a Vestal, for example, can have had little grace of congruity, to borrow a phrase from the Prayer Book. The total number of different portrait busts (apart from the many duplicates) was 52, of which a considerable number appear to be unrecorded in existing collections.

The Catalogue of 1787, of which there is an original copy in the British Museum, groups the busts, by then more numerous still, according to size, and though one or two were afterwards added, it may be looked upon as approximately complete. An occasional Venus or Minerva and the most famous bust ever produced by Wedgwood, Flaxman's Mercury, are omitted from the list here given, which is otherwise reprinted in full.

B.M.=British Museum. V. & A.=Victoria and Albert Museum.

About 25 inches high :—

Moderns. Lord Chatham (? after Wilton or Bacon), the brothers de Witt.

Ancients. Marcus Aurelius, Zeno (V. & A.), Plato, Epicurus, Junius Brutus, Marcus Brutus, Homer and Pindar.

About 22 inches high :—

Moderns. Inigo Jones and Palladio; Augustus.

Ancients. Antinous, Antonius Pius, Demosthenes.

About 20 inches high :—

Moderns. Rousseau, Swift, Grotius (V. & A.).

Ancients. Cicero (V. & A.—not the portrait recognised to-day), Faustina, Cato, Socrates, Horace (B.M.), the so-called Seneca (V. & A.).

About 18 inches high :—

Bacon (V. & A.), Johnson (? Ben Johnson ; copy in B.M. (Fig. 2)),
Raleigh, Newton, Boyle.

About 16½ inches high :—

Moderns. Dr. Fothergill.

Ancients. Young Germanicus, young Marcus Aurelius (B.M.), Agrippina.

About 15 inches high :—

Ancients. Homer, Democritus, Hippocrates, Galen, Aristotle, Cicero, Plato,
Sappho, Julia, Seneca, Virgil, Horace.

Moderns. Chaucer (B.M.), Beaumont, Fletcher, Shakespeare (B.M.), Congreve,
Prior (B.M.), Swift, Pope, Addison, Dryden, Johnson (? Ben Johnson,
a copy of which is in the B.M.), Spencer, Locke (Lever Collection)
(Fig. 3), Newton, Boerhaave, M. de Ruyter ; (one of the de Witts
is engraved on Vol. II p. 388 of Miss Meteyard's *Life of Wedgwood*).
It may be noted, in passing, that the Burgomaster of Amsterdam
supplied Wedgwood with busts and medals of Boerhaave, Grotius
(V. & A), de Ruyter, and the de Witts.

From 10-11½ inches high :—

Ancients Cicero.

Moderns. Locke, Newton, George I (? George II, a copy of whose bust by
Rysbrack is reproduced in Miss Meteyard's *Choice Examples of
Wedgwood*), Voltaire.

7 and 8 inches high :—

Ancients. Socrates, Aristotle, Marc Antony, Cleopatra.

Moderns. Newton, Locke, Pope, Prior. These were obviously pairs intended
for the mantelpiece.

From 4 to 4½ inches high :—

Ancients. Homer, Pindar, Aristophanes.

Moderns. Voltaire, Rousseau, Montesquieu.

Of some of these portraits, apart from those in the national collections, examples
are noted in certain works on Wedgwood. Miss Meteyard, in *Wedgwood and
his Works*, reproduces Spenser, Milton (both dated 1775), and the Washington,
a later work, since only a medallion is noted in the 1787 Catalogue, and it must,
therefore, date from between that year and 1795 ; and the busts of Grotius
(1777-9) and Voltaire, the first of 1777-9, the second on this scale dating from
about 1789, though an earlier and smaller version was produced ten years before.
In the same author's *Choice Examples of Wedgwood* (1879) we find that the bust
of Ben Johnson cost £2 2s. or £5 5s., 1775, the so-called Duke of Marlborough—
really Rysbrack's laureate George II—and two enchanting statuettes of Voltaire
and Rousseau, which make one regret that Wedgwood did so little in this field.
We have seen from his Correspondence that Wedgwood was always on the look

out for possible subjects for these busts. Is it possible to define his originals more closely? In many cases these were antique, though the names given are often not now accepted by modern scholarship; it is his later subjects that really interest us to-day. Sometimes a contemporary picture, medal, or engraving of either was used as a model, as in the case of Inigo Jones, Bacon, Chaucer, and the Dutch subjects; more often a bust, as more appropriate. Thus the Ben Jonson is a version of Rysbrack's bust in the Abbey, the Locke of that sculptor's bust now at Kensington Palace, in Wedgwood's day in the Queen's Grotto at Richmond; but here the mezzotint was probably used as a model, and the altered proportions and ugly circular base are anything but an improvement (Fig. 3). The Pope, an example of which is in the Tangye Collection, I have not seen, but as Roubiliac's famous bust was reproduced in Staffordshire ware, there can be little doubt that it was taken from it, as Wedgwood's Prior (Fig. 1) was taken from Coysevox's famous work in Westminster Abbey. The Shakespeare and Milton are of the Scheemaker, not the Roubiliac type.

We know the names of the workmen who modelled the busts of Shakespeare, Plato, and Aristotle (Meteyard's *Life*, II, page 389); and the firm's interest in the subject of busts continued, even after Wedgwood's death, as the Watt in the Tangye Collection at Birmingham, and the Alexander II in the British Museum, inscribed "Moscow Burnt, Europe Preserved," bear witness. The series in the Tangye Collection outnumbers all the examples in the national collections put together; there are seven of the smallest size, including "A Philosopher" not recorded in the 1787 catalogue; Voltaire and Newton in three sizes; Socrates in two; an Epicurus and Democrates not in the catalogue of 1787 (as the Democritus is also there, this latter name is not a printer's error) and a Swift, Palladio and John de Witt, not apparently in other public collections.

The Catalogues of three Loan Collections, at the Liverpool Art Club in 1879, where the Garrick and the so-called Duke of Marlborough were exhibited, at Burslem in 1895, where Cleopatra and Cornelius de Witt appeared in the small section devoted to busts, and the Sanderson Collection shown at the Museum of Science and Art at Edinburgh in 1901 are all of high interest; this last included the Marcus Brutus associated with Gibbon, and the Antinous and Herodotus in white jasper already alluded to.

It is uncertain whether the "Bustos as large as life" ordered by the Irish patron of 1779 still exist; nor does the Algernon Sidney appear to be recorded outside Wedgwood's letters. But all the evidence goes to show that it was not profit only, but public spirit that set Wedgwood on the trail of such a portrait gallery as he projected, and in so large a measure carried out. The bronzed plaster busts which, before and after, were so largely used for library decoration, were inferior in that they so early got shabby; the black basalt was sterling, as Josiah Wedgwood called it, and for those who could not afford original terra cottas by men like Rysbrack and Roubiliac, offered a much more satisfactory because more lasting substitute.

One last point needs a word, since the great authority of Mr. R. L. Hobson has accepted Miss Meteyard's statement as to the subject of the so-called Zingara.

This work appears in the Wedgwood catalogues, both as a bust and a figure, and is illustrated both by Miss Meteyard and in Mr. Hobson's sumptuous volumes on the Lever Gallery. It is usually stated to be a portrait of an actress who appeared in a play of that name acted in 1773, but though this may well have been the case, the name Zingara was applied to an antique statue in Rome with a scarf wound in her hair before Wedgwood (or the actress) was born. It was constantly copied by English sculptors, and occurs in the list of Scheemaker's work given by Vertue in 1728; Rysbrack, too, reproduced it, and the head alone was copied by Roubiliac some twenty years later. We must, therefore, reluctantly dismiss it from the list of Wedgwood's portrait busts, and place it with his Venuses and Minervas rather than with the portraits dealt with in this brief bicentenary tribute to Wedgwood's versatility.

KATHARINE A. ESDAILE.

NOTE.—This article was written before the writer had had the opportunity of seeing Mr. Harry Barnard's *Chats on Wedgwood China* (1924), which is based on documentary sources and to a large extent on the *Letters*. It would be unjust to Mr. Barnard, and to his plates, which include several of the busts here dealt with, as well as the statuettes of Voltaire and Rousseau, not to state that his book is of real value, and deserves to be consulted by every student of the subject.

MEETINGS OF OTHER SOCIETIES DURING THE ENSUING WEEK.

MONDAY, MAY 19. Geographical Society, at the Æolian Hall, New Bond Street, W. 8.30 p.m. Lt.-Colonel R. C. F. Schomberg, "Journeys in the Tien Shan." University of London, at University College, Gower Street, W.C. 5.30 p.m. Maj.-Gen. C. B. Carter, "Recent Developments in Military Education."

TUESDAY, MAY 20. East India Association, at the Caxton Hall, Westminster, S.W. 4.30 p.m. Sir Alfred Chatterton, "India's Progress and India's Poverty." Imperial Institute (Cinema), South Kensington, S.W. 2.15 p.m. Mr. Percy W. Clemens, "British West Africa." (Empire Lecture.) Statistical Society, at the Royal Society of Arts, Adelphi, W.C. 5.15 p.m. Mr. D. Cardog Jones, "Housing in Liverpool: A survey by Sample of Present Conditions."

University of London, King's College (at 40 Torrington Square, W.C.). 5.30 p.m. Dr. J. Krzyzanowski, "Joseph Conrad. Lecture I.—The Youth of Conrad." At University College, Gower Street, W.C. 5 p.m. Dr. Lythgoe, "Special Sense Physiology." (Lecture II.)

5.30 p.m. Prof. N. E. Svedelius, "The Bearing of Modern Researches on Algae, especially Rhodophyceae." (Lecture I.)

Zoological Society, Regents' Park, N.W. 5.30 p.m. Scientific Business Meeting.

WEDNESDAY, MAY 21. Asiatic Society, at Burlington House, W. 5 p.m. Mr. C. Leonard Woolley, "The Excavations at Ur, 1929-30." (Joint Meeting with the Central Asian Society.)

Eugenics Society, at Burlington House, W. 8.30 p.m. Mr. Ragu Vira, "Eugenics in Sanskrit Literature." Literature, Royal Society of, 2 Bloomsbury Square, W.C. 3.30 p.m. General Anniversary Meeting.

5 p.m. Ordinary Meeting. Meteorological Society, 49 Cromwell Road, S.W. 5 p.m. "An account of Dr. Molchanof's Method of Automatic Signalling of the results of Sounding of the Upper Air," by Sir Napier Shaw, D.Sc., F.R.S. Sir Gilbert T. Walker, "Seasonal Foreshadowing." Mr. A. C. Best, "Instruments for Obtaining Dry and Wet Bulb Temperatures."

Microscopical Society, at King's College, Strand, W.C. 3 p.m. Exhibition and Demonstration of Metallurgical Instruments and Apparatus. 7 p.m. Prof. Nils E. Svedelius, "The so-called Freshwater Lithodermia."

7.45 p.m. Discussion on "Recent Advances in Current Research and Practice in Microscopic Metallography."

University of London, at the School of Oriental Studies Finsbury Circus, E.C. 5.30 p.m. Mr. W. P. Yettis,

"Chinese Bronzes. Lecture I.—Ritual Bronzes of Ancient China."

At University College, Gower Street, W.C. 5.30 p.m. Prof. F. G. Cole, "The Early History of Generation and Comparative Anatomy." (Lecture V.)

THURSDAY, MAY 22. University of London, at King's College, Strand, W.C. 5.30 p.m. Mr. I. J. Evans, "The Economic Development of Modern Roumania (1820-1920)." (Lecture IV.)

At University College, Gower Street, W.C. 5 p.m. Dr. Lythgoe, "Special Sense Physiology." (Lecture III.)

5.30 p.m. Prof. F. G. Cole, "The Early History of Generation and Comparative Anatomy." (Lecture VI.)

5.30 p.m. Dr. C. Pellizzi, "Michelangelo." 5.30 p.m. Prof. N. E. Svedelius, "The Bearing of Modern Researches on Algae, especially Rhodophyceae." (Lecture II.)

FRIDAY, MAY 23. Physical Society, at the Imperial College of Science and Technology, South Kensington, S.W. 3 p.m. to 4.30 p.m. and 5.15 p.m. to 7 p.m. Discussion on "Magnetism." Dr. E. C. Stoner, "Magnetism in the 20th Century." Professor H. S. Allen, "Magnetism and the Quantum Theory."

Professor C. G. Darwin, "The Polarisation of the Electron." Mr. W. Suessmith, "The Gyromagnetic Effect and Paramagnetism."

Mr. F. C. Powell, "On the Change in Size of a Ferromagnetic at the Curie Point." Professor W. Peddie, "Magnetisation and Temperature in Crystals." Professor W. Weiss and Dr. R. Ferrer, "Sur l'Alimentation i Saturation des Ferrocobalts et des Nickel-cobalts et les Moments Atomiques des trois metaux." Professor W. Gerlach,

"Über neue Lusammerhange von Magnetischen n. Elektrischen Ercheinungen." Dr. F. Kapitza, "Methods of Experimenting in Strong Magnetic Fields." Dr. W. L. Webster, "On Magnetostriction and Change of Resistance in Single Crystals of Iron and Nickel." Dr. L. F. Bates, "Observations on the Specific Heats of Ferro-magnetic Substances."

Royal Institution, 21 Albemarle Street, W. 9 p.m. Mr. R. S. Whipple, "Some Scientific Instrument Makers of the 18th Century."

University of London, at King's College, Strand, W.C. 5.30 p.m. Dr. O. Odolizik, "J. A. Comenius and Schemes for the Unification of Christian Civilization."

At University College, Gower Street, W.C. 5.30 p.m. Prof. J. B. Morgan, "The Legal and Political Unity of the Empire." (Lecture III.)

5.30 p.m. Prof. N. E. Svedelius, "The Bearing of Modern Researches on Algae, especially Rhodophyceae." (Lecture III.)

SATURDAY, MAY 24. University of London, at University College, Gower Street, W.C. 3 p.m. Prof. Sir F. Petrie, "Recent Discoveries at Beth-Pelet, Palestine."

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No. 4044

FRIDAY, MAY 23rd, 1930

VOL. LXXXVIII

All Communications for the Society should be addressed to the Secretary, John Street, Adelphi, W.C.2.

NEWS OF THE WEEK

"Science when she has accomplished all her triumphs in her order, will still have to go back, when the time comes, to assist in the building up of a new creed by which man can live."

John Morley.

"You won't be able to sell a house soon unless there is room for an aerodrome."
Mr. Justice Rowlatt.

"Every town in England ought to be burnt to the ground."
G. Bernard Shaw.

The Artist and Industrial Art.—We quote the following from an interesting article in the *Architectural Review* following an article by the late Sir Lawrence Weaver. This is particularly interesting in view of the consensus of opinion that the Royal Society of Arts is more representative than any other Society of Sir Lawrence Weaver's varied activities, and it is suggested that a fitting memorial to his constructive work in the industrial world can best be represented within their buildings :—

"Quite obviously," says Sir Lawrence, "the architect cannot be expected to go out into the market place and proclaim his readiness to take a hand in industrial design. The first move must come from manufacturer and distributor."

Mr. John Elvay follows, and we quote from him :—

"One of the most unfortunate conventions of the nineteenth century was that art and business were unrelated. The artist wore his hair long and was given to Bohemian practices ; the business man wore his head bald and supported the respectable virtues ; and that, so to speak, was that. They knew their place in the scheme of things and sneered at each other with becoming virulence ; and the artists made little worlds of their own, and amid the clouds of studio

chatter thanked God that they knew nothing of business, and in the offices and factories men said that art, and particularly artists, were impractical. So hundreds of thousands of homes in this country were made desolate with furniture, carpets, wallpapers, fabrics, glass and pottery that had been produced without art and in many instances without sense.

"Business men, quite naturally, retained the habit of dispensing with the services of creative artists. Indeed, they never realised that those rather difficult people could give them any service. In the making of furniture and fabrics and other things concerned with house equipment a revival of interest in antique styles enabled them to give employment to an army of hacks who copied anything they were ordered to copy, and as for originality—well, if you had to have it, you got it from the Continent. And to-day this is apparently the attitude of big business towards the buying and selling of things with which art should have had some concern, if one may judge from the æsthetic policy (or, rather, the lack of æsthetic policy) of those impressively organised retail establishments, the great stores.

"Only in one field is the artist allowed anything approaching a partnership with business, and that is in the marketing of goods; for advertising, which is one of the functions of marketing, has provided illustrators, designers and typographers with a creative outlet. But advertising limits the artist's personal creative expression, which must be adjusted to the selling of the goods or services for which an advertisement exists. The designer engaged in what is called 'commercial art' sinks his artistic personality but preserves the individuality of his technique: he draws or paints or arranges in his own manner not what he wants to draw or paint or arrange, but the particular symbols or dramatizations required by the business of selling."

Pottery and the Wedgwood Celebrations.—This week Burslem and the Potteries are doing honour to the memory of Josiah Wedgwood, and we are looking forward to the paper on the subject by Mr. Harry Barnard (of the Etruria Museum). His admirable little book, "Chats on Wedgwood Ware," published in 1927, should have a wide sale if it is still available.

In a pamphlet published some years ago for the Design and Industries Association Mr. Hamilton Smith wrote :—

"Potters are to be congratulated on being pioneers in the formation of the first National Council under the Whitley scheme. Reconstruction, especially of outlook, is our great need. British commerce has been entrenched for a century, but your competitors are everywhere preparing to storm your entrenchments. Perhaps you think you are safe—we always do until the catastrophe—but, believe me, the years that are coming will be critical times. Technically, British goods are better than the foreigner's, but his chemists are experimenting day and night to catch up, and the British manufacturers' last line of defence will have to be design—living, progressing, and constantly developing. This may well prove to be the only way of keeping your lead. I wish to finish as I began by reiterating the D.I.A. belief that pursuit of an ideal is the only thing that makes business worth while, and to remind you again that Josiah Wedgwood was a North Staffordshire man who asked not so much what he could get out of pottery, as how he could do a thing better than it had been done before."

The question of producing a leadless glaze for pottery which would be effective without injuring the health of the workers came before the Society at a very early date, and as far back as 1793 a gold medal was offered for "glazing earthenware without lead."

Books.—THE LIFE AND LETTERS OF HENRY ARTHUR JONES BY DORIS ARTHUR JONES.—"Who would wish after death to be decorated with the cheapest trinket, the smallest grace that did not rightly belong to him?" . . . "Rather than be found strutting about after death in stolen glories and painted virtues."

This is a quotation from an unpublished book by Henry Arthur Jones himself; the author quotes it in the preface, and it seems a magnificent text for a biographer. This book is a very human and direct story of the author of such well known plays as "The Silver King" and "The Liars," and it has the additional interest of letters from Shaw, Max Beerbohm, Mrs. Patrick Campbell, Matthew Arnold and many more outstanding personalities of a great era in drama and literature. Henry Arthur Jones was a fighter, but his quarrels were never petty; in fact it is to them we owe a great many of the most delightful letters. The author has arranged them very cleverly and has mixed theatrical and personal history with great success.

"BRIEF CANDLES" BY ALDOUS HUXLEY.—There is a thin dividing line between cynicism and bitterness, but a very definite one, and in Mr. Aldous Huxley's last two books he seems to have almost entirely lost his moments of light-hearted satire and plunged into an abyss of sardonic gloom. It is a great pity as he stands alone in his particular brilliance of expression and cynical observation of people. In this book of short stories one stands out supreme and that is "The Claxtons," a perfect picture of a "arty" vegetarian household and its effect on the upbringing of the children. This is every bit as good as his descriptions of Chelsea in "Antic Hay," but the other three are absorbed with the general meaninglessness and unmorality and stupidity of life where both vice and virtue are equally dull, and where religion is the worst kind of pretence in a world of sham.

Theatres.—"OTHELLO" AT THE SAVOY THEATRE.—Mr. Paul Robeson is known in this country and all over Europe, chiefly for his singing, and it was perhaps with a certain curiosity that we went to see him play in Shakespeare, but in future he must be judged as a great actor as well as a great singer, for his powers in that direction are just as fine. He made a most magnificent and moving "Othello," giving the part both dignity and tragedy and holding a critical audience spellbound. Miss Peggy Ashcroft played Desdemona just as she should be played, with simplicity and beauty, but some of the other members of the cast were weak and inaudible and apart from the central figures the play was ragged and badly produced.

A word must be said about Mr. James Pryde's fine designs—the coast scene at Cyprus, and the bed in the last act, were particularly effective; the lovely line and lighting on the bed were as dramatic as the scene itself. We hope that Mr. Pryde will not be allowed to forsake the theatre again and that we shall see more of this branch of his art in the near future.

R.I.B.A. Gallery.—EXHIBITION OF OLD ARCHITECTURAL DRAWINGS.—There is a great charm and flavour about this exhibition as well as its architectural interest. Some of the drawings are remarkable, beautiful both in their detail and the expression of the fine proportion of the buildings represented, and it was rather interesting to compare them with the modern architectural drawings now at the Academy. The curious thing is that the older men, though they stick closely to their subject and seldom try to camouflage it with any "effects," yet achieve a far more beautiful picture. This, of course, applied also to the late exhibition of Italian Art where the absolutely simple representation gave a much more wonderful result than any of the modern theories of painting. But we do not live in those spacious unhurried days and perhaps architecture suffers more than any other art, as we can see by these old drawings, which, though they do not always represent first class buildings, yet are simply and beautifully drawn and completely fulfil their purpose. One or two particularly by Shotter Boys, besides being good architecturally, are most delightful pictures.

The Brook Street Galleries.—E. B. NICLOUX KERR AND ALSWEN MONTGOMERIE.—Flower paintings have had a tremendous vogue lately, and it is interesting to note that a Fantin Latour which could be bought for £25 thirty years ago, fetched £1,800 last week at Christie's. He is, of course, the supreme exponent of this art, and it is rather unkind to mention anyone else, however good, in the same paragraph, but Mrs. Nicloux Kerr has taken flower painting from a somewhat new angle and shown flowers more as part of a decorative scheme than in isolated pots or groups by themselves. She rather expresses the characteristics of the flower by different objects in the same group. Some of them are a little too studied and her painting has the fault of being rather over sweet and sentimental, but she has some quite successful and colourful studies. Alswen Montgomerie contributes nicely painted but not very distinguished water colours.

The Church and Art.—The Archbishop of Canterbury made an exceedingly interesting speech at the opening of the great exhibition of Medieval Art at the Victoria and Albert Museum. He made very clear the Church's position with regard to art which is so often forgotten now-a-days, and reminded us how all the

great art of former centuries was done actually for the Church or under its patronage, and with regard to different creeds, he said that after all "The family was the same though there were variations in the genealogical table!" He then thanked many people who had lent priceless treasures for the exhibition. We are not expert enough (though it would be a difficult task even for the expert), to mention any particular works of Art in this marvellous collection. Almost every one is worthy of study and representative of the best of Medieval Art in England.

THE RADCLIFFE OBSERVATORY

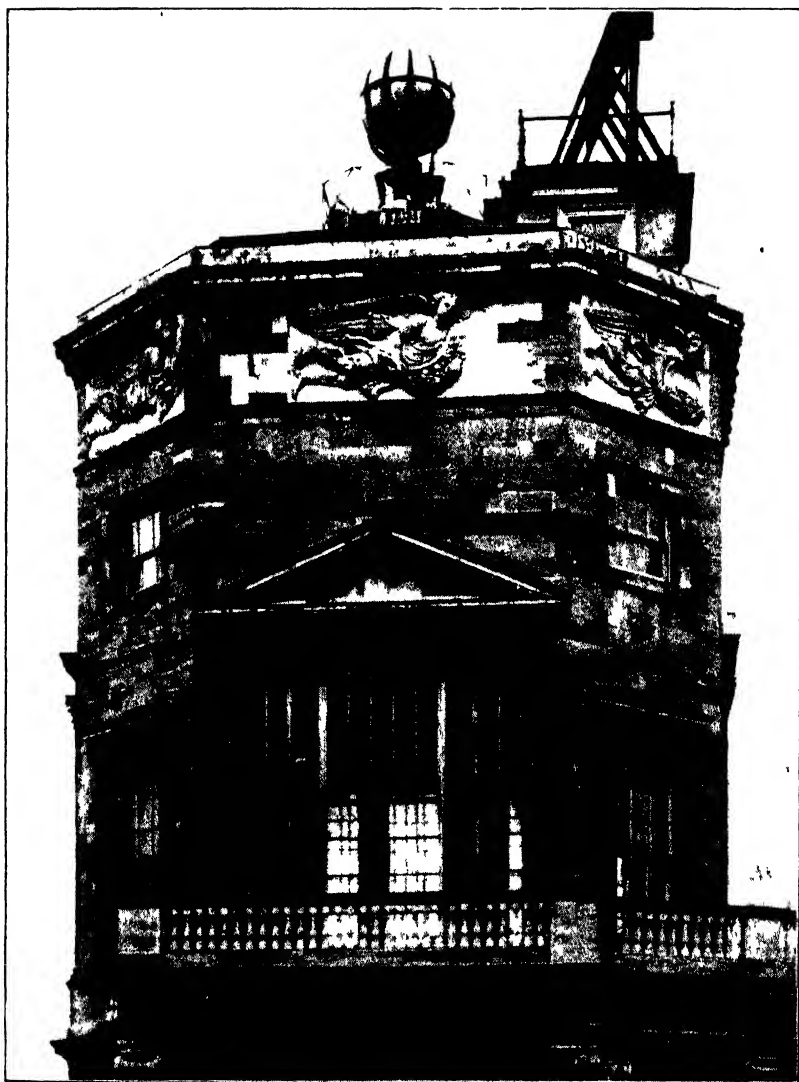
There are certain memories which those who love Oxford never lose. The Bodleian and the Camera, grouped with St. Mary's spire—especially the view from outside the Porter's Lodge at Brasenose—the garden front of St. John's, the old Ashmolean, and the vista from its doorway, once lived with are for ever present to the mind. Of isolated buildings, however, few have a greater gift for stamping themselves upon the heart—for heart and mind and memory are all concerned where Oxford is—than the Radcliffe Observatory. Designed by Henry Keene, its form is notable enough, but without its sculptures, and the green globe supported by two Atlases on top, it would be a poorer thing indeed.

My knowledge of the authorship of the sculptures was first derived from a dated but unspecified newspaper cutting in the vast collections at the Victoria and Albert Museum; now that Mr. Hussey has, in *Country Life*, given us details derived from the official records of the Observatory, it may be well to add some further particulars to what he has told us.

The source of Bacon's frieze of figures, carved direct in the stone, as Mr. Hussey notes, was the series of engravings of the Tower of the Winds in Stuart and Revett's "Athens," which gave the former the honourable prefix of "Athenian," and exercised a vast influence on the architecture of the time. Stuart—the designer of baroque monuments innumerable, by the way, of which two conspicuous examples, the Lord Howe and the Admiral Watson, are in Westminster Abbey—was one of the leading spirits of the Society of Dilettanti, although he did not live to see the publication of their two noble volumes on Great Sculpture in 1809, and one would like to have had his opinion on Bacon's work, so different in spirit from his Greek originals as to have become themselves original. The Atlases on the top—and the duplication, unless purely decorative, is something of a mystery—are based on the famous figure at Naples, which Bacon may well have come across at the Coade factory; but he has made them beardless, and thereby given them fresh grace.

To the Coade factory we owe some of the internal decorative features; and here with all respect, we must differ from Mr. Hussey. That famous factory of Artificial Stone was founded by Batty Langley, that "boldfaced adventurer" as Vertue calls him, before 1738, when it occupied the same site at Lambeth





as it occupied in 1824, when an interesting account of it, under the management of Messrs. Coade and Seeley, was published in the *Somerset House Gazette*. After Batty's death in 1751 it was taken over by one William Coade, who died in middle age, leaving his daughter Eleanor, Mrs. Coade in the speech of the day, to carry on the factory; and it was largely through the taste and energy of her young assistant, John Bacon, seconded by her own energy and strength of mind, that she managed to do so. There is an admirable letter from her to a discontented workman, printed in Jewitt's *Ceramic Art of Great Britain*, which fills one with admiration for her spirit and common sense; the business might well flourish under such heads as Eleanor Coade and John Bacon, R.A., the potter's boy turned sculptor.

If we turn to the Observatory sculptures themselves, we shall be struck afresh with the freshness of what I have elsewhere called "the magnificent Blake-like figures of the Winds" along the frieze. Bacon has altered their scale and given their wings the feathered richness found in the Cherub wings by countless sculptors of the London School from 1620 to 1730, and the hair in particular has a varied grace which is altogether charming. Bacon could invest the deeply cut wig of the period with a charm it possesses almost nowhere else; but where he can choose his style, whether that style is bold, as here, or whether, as in his mourning female figures, the hair takes on a delicate smoothness unsurpassed by Houdon. That we should lose such things is unthinkable, since they are almost the only architectural sculptures of the day which achieve the dignity of works of art, now that the pediment of Bacon's and Lamb's East India House is no more.

The whole tower is reminiscent of the Bacon circle. Rossi, as Mr. Hussey notes, was employed under Bacon at the Coade Factory, and modelled works under his master's influence incomparably more attractive than his pretentious monuments in St. Paul's. John Russell, R.A., an intimate friend and frequenter of the Bacon household, whose portrait he painted, as well as a notable astronomer, executed astronomical sketches there, one of which Mr. Hussey has reproduced, and the interest of the artificial stone details is enhanced by the fact that such things are specified in the later Coade catalogues, which specialised in architectural detail. This side of their work is best known by the once-famous Gothic Screen in St. George's, Windsor, erected by order of George III, and by the Gothic fonts and monuments to be seen in various English churches; it is illustrated here by the delicately moulded ribs of the domed ceiling in the topmost storey of the building.

One last point, though it has to do with Bacon rather than with the Observatory. When I first wrote of the Blake-like figures of the Winds, I omitted to note the singular fact that one of Blake's more important engravings is his print of Bacon's Thames in Ducarel's *History of Lambeth*. The statue, with its grave Zeus-like face and flowing hair and beard, must have impressed itself upon young Blake's imagination; is it merely a fancy of my own that Blake's great bearded figures, which appear from Urizen to Job, are all long subsequent to this early and almost

unnoticed work? Is it not possible, that is, that Bacon's figure is the unconscious source of much of Blake's imaginative work? The thought will not make us less determined that Bacon's architectural masterpieces on the tower of the Radcliffe Observatory shall not perish from the face of the land.

K. A. ESDAILE.

NOTICES

COUNCIL

A meeting of the Council was held on May 12th. Present:—Mr. Llewelyn B. Atkinson, M.I.E.E., in the Chair; Sir Charles H. Armstrong; Dr. Edward F. Armstrong, Ph.D., D.Sc., F.R.S.; Sir Basil P. Blackett, K.C.B., K.C.S.I.; Mr. Alfred C. Bossom, F.R.I.B.A.; Sir David Chadwick, C.S.I., C.I.E.; Sir Atul C. Chatterjee, K.C.I.E.; Captain Sir Arthur Clarke, K.B.E.; Sir Dugald Clerk, K.B.E., D.Sc., F.R.S.; Sir Edward Gait, K.C.S.I., C.I.E.; Mr. John S. Highfield, M.Inst.C.E., M.I.E.E.; Col. Sir Arthur Holbrook, K.B.E., M.P.; Mr. P. Morley Horder, F.S.A.; Major Sir Humphrey Leggett, D.S.O., R.E.; Sir Philip Magnus, Bt.; Sir Reginald A. Mant, K.C.I.E., C.S.I.; Col. Sir Henry McMahon, G.C.M.G., G.C.V.O.; Sir Henry A. Miers, F.R.S.; Mr. John A. Milne, C.B.E.; Hon. Sir Charles A. Parsons, O.M., K.C.B., LL.D., D.Sc., F.R.S.; Col. The Master of Sempill; Sir George Sutton, Bt.; Mr. James Swinburne, F.R.S.; Mr. Carmichael Thomas; Dr. Henry T. Tizard, C.B., F.R.S.; and Lt.-Col. Sir Arnold T. Wilson, K.C.I.E., C.S.I., C.M.G., D.S.O., with Mr. G. K. Menzies (Secretary) and Mr. W. Perry (Assistant-Secretary).

The following candidates were duly elected Fellows of the Society:—

Agricultural Economic Research Institute, Oxford.

Bache, Jules S., New York City, U.S.A.

Carmichael, Sir James, K.B.E., Kingston-on-Thames, Surrey.

Charnaud, Percy, London.

Clarke, Walter Douglas Montgomery, Bombay, India.

Cooke, Stenson, London.

Cull, Bertram Noel, Taunton, Somerset.

Edwards, Llewellyn Nathaniel, D.Eng., Washington, D.C., U.S.A.

Gardiner, William Guthrie, Stirling.

Hambleden, Right Hon. Viscount, London.

Hendriks, H. Leslie, Kingston-on-Thames, Surrey.

Hutchinson, Herbert, Haslemere, Surrey.

Johnson, Mrs. Alma Mary, London.

Jurgens, Anton, London.

Kay, Edgar Boyd, Washington, D.C., U.S.A.

Ponsonby, Right Hon. Lord, Haslemere, Surrey.

Power, Thomas J., Kilrossanty, Co. Waterford.

Priestley, Mrs. John Whitaker, Illingworth, Halifax.

Rack, Edgar C., New York City, U.S.A.
Reilly, Professor Charles Herbert, O.B.E., M.A., Liverpool.
Robertson, Vivian Elphinston, London.
Smith, Percy, London.
Strachan, Douglas, LL.D., Lasswade, Midlothian.
Tafel, Robert R., Philadelphia, Pa., U.S.A.
Tan Sip Chew, Singapore, Straits Settlements.
Weaver, Lady, Ashstead, Surrey.
Wilson, John G., London.
Wilson, Robert Francis, Nottingham.

The question of the award of the Society's Albert Medal for 1930 was further considered, and names were selected for submission to H.R.H. the President.

The preparation of the balloting list for the new Council was completed.

The number of entries for the May Examinations was reported.

A committee was appointed for the purpose of adjudicating the award of the Society's silver medals for papers read during the session 1929-30.

The arrangements for next session were considered.

A committee was appointed to consider the question of the printing of the *Journal*.

A quantity of financial and formal business was transacted.

NEXT WEEK

WEDNESDAY, MAY 28th, at 8 p.m. (Ordinary Meeting.) HARRY BARNARD, "The Father of English Pottery—JOSIAH WEDGWOOD, F.R.S., Potter, Inventor and Man of Science." Frank H. Wedgwood will preside. The paper will be illustrated by lantern slides and examples of pottery.

ORDINARY MEETING

WEDNESDAY, MAY 14th, 1930. SIR EDWARD DAVSON, Bt., Deputy Chairman, British Empire Producers' Organisation, in the Chair. A paper entitled, "The Cultivation and Preparation of Rice" was read by MR. CHARLES E. DOUGLAS, M.I.Mech.E., M.I.Struct.E. The paper and discussion will be published at an early date.

REPRINT OF CANTOR LECTURES

The three Cantor Lectures on "Wind Instruments from Musical and Scientific Aspects," by Dr. E. G. Richardson, Ph.D., D.Sc., Lecturer at University College, London, have now been reprinted in pamphlet form (price 2s. 6d.), and can be obtained from the Secretary, Royal Society of Arts, John Street, Adelphi, W.C.2.

A complete list of Cantor, Howard and other lectures, which are available in pamphlet form, can be had on application.

PROCEEDINGS OF THE SOCIETY

INDIAN SECTION

TUESDAY, MARCH 4TH, 1930

GEORGE MASTERMAN GILLET, M.P., Parliamentary Secretary, Department
of Overseas Trade, in the Chair

THE CHAIRMAN, in introducing the lecturer, said that everyone was acquainted with the fact that Great Britain had Ambassadors and Ministers in other countries, but it was not always realised that she also had representatives of trade and commerce, who were called Commercial Counsellors or Commercial Secretaries in the case of foreign countries, and Trade Commissioners in the case of the Dominions. The Trade Commissioners were connected with the Department of Overseas Trade, over which it was his privilege at the present time to preside, and from his experience there he felt that this country was very fortunate in many of the men who served it in this capacity in the Dominions and in India. One of the most distinguished of these Trade Commissioners was the lecturer of the afternoon, Mr. Ainscough, who was going to speak on "British Trade with India." Mr. Ainscough was the senior Trade Commissioner in India and Ceylon, and therefore he spoke on a subject with which he was very well acquainted.

The following paper was then read :—

BRITISH TRADE WITH INDIA.

By T. M. AINSCOUGH, C.B.E.,

H.M. Senior Trade Commissioner in India and Ceylon.

The Indian Section of this Society has for many years provided for its members a brilliant series of papers relating to almost every facet of Indian development—political, social and economic. Papers such as those recently read by Mr. Green on "The Indian Cinematograph Industry" and by Sir Basil Blackett on "The Economic Progress of India" are invaluable in giving us a vivid picture of the remarkable strides which India has made since the war in almost every branch of economic activity. The efforts of the High Commissioner for India and of the Empire Marketing Board have also been most successful in impressing upon the British Public the desirability, on Imperial grounds, of increasing and widening the range of its purchases of Indian products. Stress has, very properly, been laid upon the valuable productive asset which the British Commonwealth of Nations possesses in India—the sixth trading nation and the seventh industrial power in the world.

Foreign trade, however, is essentially reciprocal. I propose this afternoon to approach the subject of British Trade with India from a different angle and rather as an interpreter of United Kingdom interests. I propose to deal with India

as the greatest market in the world for British goods and to address my remarks primarily to British Industrialists and Exporters.

When I last had the honour of addressing this Society in 1920, the short-lived post-war boom was drawing to a close. British exports to India in that year had approached the record value of £200 millions sterling, which represented 61 per cent. of India's total imports—a figure within two per cent. of our position in the last pre-war quinquennium. The succeeding slump and the persistent depression of the last ten years, during which the British percentage has steadily fallen from 61 to below 45, are fresh in our minds. The present appears, therefore, to be an opportune time to review the situation. We are constantly being reminded in these days of unparalleled unemployment that the core of the problem is the revival of the export trade. India is our greatest market, which even in 1928 absorbed £84 million sterling of British goods, i.e. $11\frac{1}{2}$ per cent. of our total exports, 28 per cent. of our shipments of cotton piece goods, 16 per cent. of our shipments of iron and steel and 19 per cent. of our exports of machinery. The British shipments to India even in that year of depression exceeded those to our next most important market, Australia, by nearly £30 million sterling. It is obvious therefore that the prosperity—indeed almost the very existence—of our basic industries depends directly upon the purchasing power of the 320 millions of our fellow subjects in India. This is my justification for endeavouring to place before you this afternoon some considerations upon the present position of our leading export trades in the Indian market, the sources of our weakness and of our strength, the reactions which certain recent developments have had on our position, and the measures which are necessary if we are to regain a portion, if not all, of the ground which has been lost.

I have recently had the opportunity of conferring with nearly five hundred manufacturers and exporters who are interested in our trade with India. I have found widespread anxiety as to the reactions of political agitation on our export trade with the market. The alarmist views of a section of the Press in this country have created a distinct sense of nervousness among certain manufacturers who are not conversant with the true state of affairs, and are not aware of the sound, steady and statesmanlike attitude which is being maintained by the leading organs of the European press in India and by the leaders of the commercial community on the spot. The present, therefore, seems to be an opportune time to take stock of the conditions and prospects of United Kingdom trade with India, so that we may form an opinion as to how far—if at all—these misgivings are founded on fact.

In order to bring the subject into focus it will be necessary to recapitulate the main facts of our present position. These have been stated in previous addresses elsewhere, but they are a necessary background before we consider the detailed position of our principal trades in India. In the first place, we are faced with the most disquieting fact that the United Kingdom's share of India's total imports has declined from an average of 63 per cent. in the last five pre-war years to less than 45 per cent. in the fiscal year 1928/29. I attribute this remarkable fall to

four main causes, of which the first two are incidental and the second two are vital :—

Firstly—to the steadily increasing imports into India of certain foodstuffs and raw materials such as sugar, spices, oriental provisions, raw cotton, raw wool and raw silk, mineral oils, timber, etc. There is a valuable British distributing interest in most of these commodities, but they are not produced in this country.

Secondly—to the temporarily reduced demand for British specialities such as cotton piece goods, textile machinery, railway plant and certain other types of machinery which normally form such a large proportion of the total British shipments that any material decrease in the offtake affects the British proportion of the total trade.

Thirdly—to the fact that the Indian market since the war has not yet adjusted itself to the higher post-war level of prices of imported goods. Speaking generally, the great majority of Indian consumers have only a very small margin of means to spend on cotton cloth and other imported commodities. British manufactured goods are usually articles of good quality and fine workmanship, the price of which has advanced in greater proportion than that of most goods owing to the heavy overhead charges and increased labour costs in the United Kingdom. The Indian consumer has, therefore, been forced either to substitute cheaper qualities of foreign or local manufacture or else to practise economy and reduce his requirements, a habit to which he became accustomed during the war and which is likely to continue for some time. The volume of India's requirements is in inverse ratio to their price.

Fourthly—to the onset of foreign competition which now enters into almost every trade, including those which before the war were exclusively British. The reduction in the British share since the war is almost exactly counterbalanced by the increase in the combined share of our principal competitors :—Germany, the United States, Japan, Belgium and Italy. The outstanding features of recent years have been intensified German competition in dyes, chemicals, machinery, metals, hardware, cutlery and the countless cheap products for the bazaar trade ; a phenomenal rise in the imports of Japanese cotton and artificial silk piece goods ; heavier shipments of Belgian iron and steel ; larger purchases of Italian cotton and woollen piece goods and artificial silks ; and increased arrivals from the United States of raw cotton, motor vehicles, electrical and other machinery, tools, hardware and high grade articles for personal and toilet use.

The Indian market may conveniently be divided into two separate and distinct groups :—Firstly, there are " the bazaar trades," which include all the imported articles in general use by the vast Indian population, and which are sold to Indian importers and dealers in the bazaars at the ports and large distribution centres throughout the country. In this group price considerations are paramount, and low price and showy appearance are greater desiderata than quality, durability or even value for money. This group includes cotton and woollen piece goods and the lower grades of metals, hardware, chemicals, etc., etc. It constitutes

some 60 per cent. of our trade with India and accounts for almost the whole of the ground which has been lost. Until we can bring down British prices by rationalization of production and by the adoption of mass distribution, it is difficult to see how we can meet the growing competition from the Continent and Japan in this great group of trades.

The second group may be termed "the heavy trades." It comprises iron and steel; machinery; railway, harbour and Public Works plant and equipment; engineering and mill stores of all kinds, both for Government use and for the maintenance of India's power stations, industries, mines and large scale enterprises. This group accounts for approximately 30 per cent. of our Indian trade. Here we find that the British position rests upon firm bases. The adoption throughout India of British engineering standards has been of material advantage. British reputation for design, quality and workmanship stands very high. Our leading manufacturing engineers usually either maintain branch organisations in India, staffed by highly-trained engineers and commercial men, or attach their own experts to the staffs of their agents. The fact that we have been able generally to maintain our position in this group affords eloquent proof of the value of "service," which is the keynote of success in these trades. At the same time, several recent developments tend to threaten our position and call for increased effort and vigilance. These will be dealt with in the brief survey of the position in individual industries with which I will now proceed to deal.

The most important individual British contribution to the "bazaar" trade is, as everyone knows, the export of cotton piece goods. In pre-war days it represented roughly half the value of our total exports to India and even in these depressed times it accounts for 40 per cent. of our trade. The falling-off in the total imports from all sources of cotton piece goods into India from well over 3,000 million yards in 1913/14 to just under 2,000 million yards in 1927/28 synchronising with a reduction of the British share of that trade during the same period from 97 per cent. to 78 per cent., accounts for the anxiety which is being felt in cotton trade circles with regard to the Indian market. The falling-off in India's takings of imported cotton goods is in inverse ratio to the increase in their price. The quantity of cloth available for consumption in the country in 1927/28, i.e., the total of imported goods plus India mill production less exports nearly reached the 1913/14 level. Imported goods, however, had fallen from over three to under two thousand million yards while Indian mill production had advanced correspondingly from one to well over two thousand million yards. These Indian mill products are quite different types of cloths and cannot be considered to compete—quality for quality. The market has, however, to a large extent, forsaken the higher priced finer fabrics and has been driven to substitute the coarser cloths which it can afford. This process of substitution is likely to continue until Lancashire prices are on a lower level, but each year that passes tends to make it more difficult to revive the old, finer qualities. Japanese competition is increasing rapidly and covers a constantly widening range of fabrics. Since 1913/14 the percentage

share of the United Kingdom in the total quantitative imports has fallen from 97 to 78, while that of Japan has advanced from .3 to 16.4. The trade in bleached goods is still strongly held (United Kingdom 94.7 per cent.—Japan 1 per cent.) but in grey goods the percentages are United Kingdom 74.4—Japan 24.5, and in coloured goods the United Kingdom 69.8—Japan 20.3. The sudden development by Japan of a large trade in artificial silk and cotton mixture cloths during the past eighteen months is most striking. Japan has forced her way into the Indian market on the score of price and price only. She is able to undersell the products of the Indian mills as well as those of Lancashire. So far as can be ascertained, the Japanese do not give extended credit or other special facilities—in fact their terms are usually for cash. They have, however, standardised on certain qualities, notably of grey shirtings and dhooties, and have brought down their prices to a level which is so far below that of the British competing article that their sale gives the maximum profit to the Indian importer and dealer. It is noteworthy that in these standard grey cloths the Lancashire practice of giving the consumer exactly what he asks for as regards dimensions, construction, borders, headings, etc., has been defeated by Japanese standardisation on a few suitable qualities, the prices of which are so attractive as to overcome all the vested interests in British marks and numbers, which have been established on the market for decades.

It seems to me that the remedies for the present state of affairs in India lie mainly in Lancashire itself. The problem to be solved is a production problem rather than one of marketing. Neither Japan nor the Continent employ any more novel or efficient methods of distribution than those of our merchants, who frequently undertake the marketing in India of Continental specialities. Any form of rationalisation of production which will bring down our cloth prices to a competitive level and, at the same time, will not impair our elasticity in meeting the complex and constantly changing demands of an exacting market, deserves consideration.

The progress which is being made by the Lancashire Cotton Corporation, the Eastern Textile Association and similar amalgamations in process of formation, though slow, appears to be on the right lines. The researches of the Joint Committee of Cotton Trade Organisations is throwing a flood of light on the subject. To quote the concluding remarks of Messrs. Barnard and Hugh Ellinger in their paper on "Japanese Competition in the Cotton Trade," recently read before the Royal Statistical Society :—

"Lancashire is still a giant, exporting approximately even now half the cotton goods which are exported from all the countries in the world. But times have changed. It appears to us that the Colossus is astride of two centuries; a quarter of a century ago it took a great step from the nineteenth into the twentieth century with one leg and has this foot planted on the firm ground of efficiency, co-operation and combination, but the other leg remains in the nineteenth century, and this foot is imbedded in the bog of extreme individualism, expensive overlapping and wasteful internal competition. If the Colossus now has the

will and the power to complete its stride and plant both legs firmly in the twentieth century, then we believe that the British cotton industry may once more regain its former prosperity."

Apart from cotton textiles the United Kingdom has been steadily losing ground in the whole range of bazaar products where cheapness is the prime consideration. We are being undersold by Belgium and Luxembourg in steel bars, by Germany in copper and yellow metal sheets, by Germany, Sweden and other Continental producers in cheap hardware, by Czecho-Slovakia in boots and shoes, and so on through the whole gamut of these trades. Even before the war Continental prices were lower than British quotations for most cheap bazaar lines, but dealers were willing to pay a small premium for British quality, which was recognised, and we held a large share of the trade. Owing to the great increase in the British cost of production since the war, our prices of these low grade articles are beyond the purchasing power of the Indian people. In many articles of hardware and sundry goods Continental makers can now underquote to the extent of 15 to 20 per cent. The Continental goods, in many cases, are of lower quality, but they serve their purpose and, moreover, the Indian importers, dealers, and other lesser middlemen are usually able to make greater profits on these goods. The result of the past ten years' trading in the bazaars is that we have, very largely, lost that reputation for cheapness which is the sole criterion in a limited price market like India.

One is forced to the conclusion that the industries concerned in this country are organised in too small units. This is particularly noticeable in large sections of the hardware industries in the Midlands. Standardisation on a few types and large scale production are the only means of bringing prices down to the level required in Eastern bazaars. Where these methods have been adopted—for example in the cycle industry, the soap industry and important branches of the chemical industry—British manufacturers are consolidating and expanding their trade in India and can afford to embark upon extensive distributing organisations throughout the country. On the other hand, the average small concern in—say Sheffield, Birmingham and the Midlands, is forced to spread its oncost over a very small output, rarely secures long runs of production, and finds that 5 per cent. is the utmost that it can allow to cover all distribution commissions and expenses. It is thus impossible to reduce prices and also to adopt any extensive sales organisation.

The only remedy would appear to lie in rationalisation of the industries concerned and in the establishment of separate plants for the manufacture, by mass production, of certain standard types which, after careful investigation, are found to command a steady sale at a price which will meet world competition. The extent of the demand for the typical "bazaar" articles is almost incalculable, as they find a market not only in India, but in practically every bazaar from the Levant, through Egypt and the Near East, the Straits¹⁸, Dutch Indies, China and

Japan. These standard types of goods should be marketed under entirely new names and trade marks, as it would be fatal to compromise the reputation for quality which our well-known marks have acquired after nearly a century of trading. As a striking example of what can be done by determined effort I would cite the case of one or two British manufacturers of pedal bicycles who are able, as a result of special organisation of the kind I am advocating, to land a bicycle in Bombay for £2 15s. od. c.i.f. As a result, this country supplied to India last year over £800,000 worth of cycles and parts, representing over 80 per cent. of the total imports. The value of our shipments of cycles was considerably in excess of our shipments of motor cars.

It is rather a relief to turn from the bazaar trades to the heavy trades, where British Industry, even though it is faced with great and increasing handicaps, is by dint of its own efforts generally managing to maintain its position in India. It will be convenient first to consider the iron and steel trade, which is in an intermediate position, as 50 per cent. of our shipments represent sheets and bars, which are bazaar items, while the remainder comprises structural steel, bridgework, etc., which falls definitely within the category of the "heavy" trades. In 1913/14 British shipments to India of iron and steel were 609,000 tons representing 59.8 per cent. of the total imports. In 1928/29 we shipped 650,000 tons, representing 55.5 per cent. of India's imports. This result is satisfactory when we consider the keen Belgian competition in bars and also, recently, in galvanised sheets. The leading groups of British steelmakers are following up the rationalisation of their production in this country by the establishment of branches, stockyards, and efficient technical agency arrangements in India. This farsighted development of their distributing organisation should result in a marked improvement of our position in the next few years. Notwithstanding the fact that the Tata Iron and Steel Works produced over 400,000 tons of finished steel in 1927/28 and the Indian Tinplate Company are steadily increasing their output, both concerns taking the fullest advantage of a protective tariff, I maintain that the demands in India for railway, public works, building and general industrial requirements will be so great that the market for British steel will continue to expand "pari passu" with the general development of the country. India's economic development is likely to be so great that she will require increasing quantities of British standard steel, rolled to the British standard specification, which has an established reputation and, moreover, has the advantage of a lower tariff. I am convinced that our policy should be to co-operate as far as possible with the Indian steel and tinplate producers so as to prevent any wasteful overlapping of effort. The market is large enough for both of us. The Indian production is in the hands of two powerful and well-managed concerns. The iron and steel industry, so far as India is concerned, would appear to be one which would offer ideal conditions for rationalisation on Imperial lines. I would strongly commend the proposal to the National Federation of Iron and Steel Manufacturers with the further suggestion that the appointment by the Steel Export Association of a senior resident

representative in India, who could act for and negotiate on behalf of the British steel Industry as a whole, would be a step in the right direction.

Let us turn now to the immense market for machinery and plant, which is steadily expanding and amounted last year to over £14,000,000, of which this country secured £11,000,000, or 76½ per cent. as compared with 90 per cent. in 1913/14. United States competition in mining, electrical and industrial machinery accounts for 11 per cent. and is increasing. Germany also supplies electrical, oil crushing, rice milling and miscellaneous industrial plant to the extent of 6½ per cent. India stands on the threshold of great economic development, both agricultural and industrial, and the stimulus which is already being given to the demand for machinery and plant of all kinds is likely to become much more powerful. The generation and distribution of power is still in its infancy and the application of it to agricultural operations, small industries, lighting and countless other economic activities will provide a constantly expanding market for boilers, prime movers of all kinds and electrical plant. The imports of textile machinery are also likely to reflect the renewed prosperity of the jute industry and the recovery and modernisation of the cotton mills. Mining and oil-well engineering provide an improving market for plant of all kinds, while the demand for specialities such as sewing and knitting machines, typewriters, etc., grows apace. British manufacturers have hitherto led the way in providing India's requirements of machinery and industrial plant and there would seem to be no reason why they should not continue to do so. The keynote of success is an efficient organisation on the spot and technical service. Our leading manufacturing engineers early realised this fact, with the result that there are to-day scores of branch offices, staffed by trained engineers, who are prepared not only to sell and erect the plant, but to provide technical advice and service after sale, which is all-important. Where representation is in the hands of local agents, it is almost essential that the manufacturer should attach his own expert. The Indian industrialist now demands the most efficient and economical plant which the world can provide, and insists upon discussing the solution of his production and engineering problems with expert engineers rather than with young mercantile assistants possessing merely catalogue knowledge. The growing tendency of managing agency firms in India to place their engineering contracts locally rather than through the medium of their London offices places foreign competitors in a position of greater equality. This tendency applies also in the case of harbour authorities, municipalities and public utility companies. In the heavy trades the British product is generally suitable to the needs of the country as regards design, quality, workmanship and price. Our engineers enjoy an established position and a reputation for efficiency and adaptability which is second to none. If they will continue to adapt their organisation in India to meet the changing conditions and needs of the market, there would appear to be no reason why they should not maintain their position.

No account of our trade with India would be complete without a reference to the vast traffic in Government Stores of all kinds for the use of the Railways,

Public Works Departments, hydro-electric enterprises, and other activities of the Government of India and the Provincial Governments. The early inauguration of a system of purchase by rupee tenders will effect almost a revolution in our methods of representation. Hitherto these purchases have been made by the India Store Depot in London and by the London offices of the Company-operated lines. The Government of India and the Indian State Railways will, in future, buy the bulk of their stores in India, calling for tenders in rupees from the local branches or agents of British and foreign manufacturers and making payment in rupees to these branches or agents. The British supplier will be forced to develop as efficient a sales, technical and service organisation in India as he has hitherto employed in London. The new Stores Rules have been widely published and commented on, and I would here confine myself to stating that although the Rules do not come into force until January 1st, 1931, they are, in practice, already being acted upon so that no time should be lost in perfecting our organisation. The preamble of the revised rules states definitely that the policy of the Government of India is to make their purchases of stores for the public service in such a way as to encourage the development of the industries of the country to the utmost possible extent consistent with economy and efficiency. This policy is being carried out most zealously by the officers of the Indian Stores Department and by the Railway Board, who appear to be determined to purchase their requirements from Indian industries if possible, and, failing that, from the most economical source of supply irrespective of country of origin. British manufacturers must realise that, apart from the results of their own efforts, they will have no advantages in competition with foreign interests, and, in the case of competition with Indian industries, the scales will be heavily weighted against them. Their success will therefore largely depend upon the suitability of the Indian organisation which they set up. The ideal form of representation for the large firms of manufacturers of rolling stock, steelwork, permanent way material and other important items of railway stores would seem to be an Indian Limited Liability Company, with in some cases a proportion of Indian directors on the board, holding stocks of those stores or parts which are in constant demand, assembling its products in India where such a course conduces to efficiency or economy, and manufacturing locally those portions of its products which can be manufactured more advantageously in India.

I find that the important British manufacturing interests are fully prepared to take all necessary steps to meet the requirements of the Authorities in India, but they consider it to be most unfortunate that the Government of India should have been forced on financial grounds to curtail its railway programme at a time of such widespread unemployment. On the one hand we have in India a programme of railway development which would be almost immediately reproductive and which is urgently required for the economic development of the country. On the other hand, we find the Imperial Government, faced with its unemployment problem, striving to find projects in the Colonial Empire which it can finance and so provide

an outlet for our manufactures, while, at the same time, developing our Imperial estate. As Sir Basil Blackett recently stated in this place :—

“ There would seem to be something lacking in the sphere of Imperial economic co-operation if this opportunity of benefiting India and using the spare productive capacity of this country should have to continue to be neglected.”

The railways of India present a magnificent asset and almost unlimited scope for expansion on sound and reproductive lines. I would like once again to express the hope that the British investing public will appreciate this by continuing to give their support to Government of India loans. By so doing they will not only be obtaining a gilt-edged security for themselves, but they will be contributing to the finance of that valuable trade in railway plant for India which is one of the mainstays of our engineering industry.

It may now be convenient to examine certain weakening factors which have become apparent during the last few years and which will require to be overcome if the British exporter is to maintain his position in the India of the future. In the first place it is necessary to emphasise the fact that the British manufacturer can no longer afford to leave the marketing of his products entirely in the hands of merchants, but must himself take an interest in and generally supervise the processes of selling, propaganda, and advertising until the goods actually reach the ultimate consumer. The whole fabric of British economic activity throughout the East has been built up and sustained by the great firms of Eastern merchants who—since the days of the East India Company—have extended British influence, have borne the brunt of slumps and financial crises and have taken the credit risk from the shoulders of the manufacturer. This system, however, has had the great weakness of presenting a barrier between the Producer and the Consumer. The manufacturer has not had the opportunity of studying for himself the precise requirements of the market and has consequently not adapted his production so closely as he might have done to changing tendencies in demand. On the other hand, the merchant in India, holding numerous agencies, has had too many irons in the fire to give close attention to any one of them. He has not considered his remuneration to be sufficient to justify the expense of establishing an extensive sales organisation on modern lines. His local interests in the export of Indian produce, in shipping, insurance and in the promotion and management of Indian industries (many of which competed with the productions of the British manufacturers he represented) have become so important that he has become less and less interested in the import trade. These remarks do not apply to the distribution of cotton textiles which is in strong hands, nor do they apply to a few of the engineering merchants who, in collaboration with their Principals, have built up an efficient sales and service organisation. Broadly speaking, however, the number of efficient, modern selling organisations adequately covering the Indian market and making full use of present-day methods of distribution is remarkably few. The distribution of cigarettes, kerosene, certain chemical products, soap and sewing machines

are outstanding examples of efficient marketing, but it is noteworthy that in each of these instances it is the manufacturer who has undertaken his own distribution. Similarly, the manufacturers of heavy machinery and plant have maintained their position only by establishing their own branches or by attaching their own experts to the staffs of their agents. Many of the criticisms that are levelled at the British manufacturer to the effect that he does not sufficiently study the exact needs of the market should really have been addressed to the Eastern merchants, who have undertaken the responsibility of distributing his goods, but have failed to keep him apprised of conditions and have made no attempt to install any adequate sales organisation. There are distinct signs, however, that both manufacturer and merchant realise the need for co-operation and a closing of the ranks in face of the onset of foreign competition. The past ten years have witnessed a quickening of interest in the market by the larger manufacturers and a determination to take a hand in the distribution of their goods, whether by their own organisations or by strengthening their merchant agents.

I believe that we are on the eve of a period almost of revolution in our marketing methods in India—a period which will be marked by a steady increase in the number of manufacturing firms, who develop a system of branches and agencies throughout the country and bring their products to the town and village shops of the people through a system of guaranteed agents and sub-agents working under the supervision of travelling inspectors. It may be urged that the number of articles in universal demand in a relatively poor country such as India is strictly limited, but until our products are adequately shown and made available, backed by sound advertising campaigns, it is impossible to assess the potential demand. There are numerous examples, both in China and in India, where demand has literally been created by efficient distribution and advertising. It will also be urged that such extensive methods entail so heavy a capital outlay that only powerful firms such as the great tobacco, oil and chemical concerns can possibly undertake them. This difficulty can be overcome either by a grouping of manufacturers to undertake the work, or, more likely, by Indian merchants expanding their organisation in co-operation with their Principals. The rationalisation of industry which is proceeding in this country, which will result in the emergence of a small number of very powerful firms, will, it is hoped, be followed by a rationalisation of marketing throughout the world and particularly in India, where it is so urgently needed. My experience in China and in India proves that where extensive methods of distribution have been adopted, the results have exceeded all expectations, and a demand has been created for commodities which were hitherto almost unknown on the market. I feel sure that if any of my friends among the large distributing organisations are here to-day, they will confirm this statement.

The present is an opportune time to revise our marketing methods. Despite the well-worn statements of the poverty of the masses in India there is no doubt that the standard of living of large sections of the population—particularly in the towns—has risen considerably during the past ten years. One has only to study

the number of articles which were formerly regarded as luxuries, but which are now necessities, to realise this fact. The excellent paper recently read in this place by Mr. Green on the Indian Cinematograph Industry must have been a revelation to many of our members of the new spirit which is abroad in India. There is a great opportunity to take advantage of that new spirit if our exporters will only realise that the Indian market requires close study and adaptation of methods to its special needs. The Indian consumer to-day is one of the most exacting buyers in the world and calls for the most efficient service which we can give.

One of the most striking features of recent years is the increasing association of Indians, not only in the Government of India and in the Public Services, but also in the management of Indian industries and in the import trade. This is a perfectly natural development and is one in which the British exporter has always been prepared to co-operate. The recent inauguration of the Indian Chamber of Commerce in London and the election of two Indian merchants as members of the Baltic Exchange will be welcomed by all those who have the improvement of our trading relations sincerely at heart. Trade is a great solvent and a valuable binding element between the parts of this great Empire. It is fortunate that economic relations are not trammelled by considerations of race or caste or creed. Even during the political crises of the past ten years, when racial feeling was at its height among politically-minded Indians, the close and friendly relations between British and Indian merchants, based upon mutual respect and community of interest, remained unimpaired and withstood the attempts of extremist Indian politicians to create discord. The developments in the sphere of marketing British goods in India, to which I have already referred, should and undoubtedly will bring the two peoples into closer contact and tend to remove certain misconceptions and prejudices on both sides which are largely the result of lack of understanding. The large British firms of Government contractors, manufacturing engineers and others who have formed Indian Limited Liability Companies are already adding prominent Indians to their boards of directors in order to obtain their co-operation and influence. It is only natural that an increasing number of the Indian apprentices who are serving their time, in great numbers, in British works should remain in the employ of those Companies and should return to India, attached to the staffs of the manufacturers' branches or agents. The number of Indian importers who are developing direct connections with British and foreign exporters in the bazaar trades, notably in cotton and woollen textiles, is expanding rapidly, while the influence of Indian Trade Associations such as the Piece Goods Dealers' Associations in certain places and the Marwari Association in Calcutta is becoming increasingly apparent.

India is committed to the policy of discriminating protection, and during the past seven years fairly heavy protective duties have been imposed upon steel, fabricated steelwork, tinplates, paper and a few less important articles. It is gratifying to observe that the effect of these duties on the import trades concerned

has not been so restrictive as one might have expected—in fact British steelmakers have derived some advantage *vis à vis* their Continental competitors from the differential duties on standard steel. There remain very few local industries which require protection and which would comply with the three basic conditions on which the Tariff Board are prepared to consider applications. Tribute should be paid to the Indian Tariff Board for the thorough and scrupulously fair manner in which they have carried out most difficult and complex investigations.

As we have observed in the case of the curtailment of the railway construction programme, the economic development of India or, at all events, that portion of it which is under the control of Government, is likely for some time to be retarded owing to financial exigencies. Similarly, capital is urgently required to finance the numerous attractive projects such as power schemes, public utility companies and the like, which await the enterprise of the private promoter and investor. The situation would seem to present an opportunity for the joint co-operation of the large managing agency firms in India, the British manufacturers concerned and the finance companies in the City of London with which many of them are closely allied—particularly in the electrical industry. During the past year we have seen, both in Bombay and in Shanghai, the acquisition by American financial groups of the control or joint control of great power supply companies. We know that American financiers, working in the closest touch with American industrialists, are prepared to invest large blocks of capital in the development of electrical undertakings in the East. India urgently needs capital for her development. The amount she can raise herself is limited, although it is increasing at a most encouraging rate. Unless, therefore, the London Financial Houses are prepared to support the Indian promoters of these schemes, it is likely that the American offers will be accepted and the supply of large quantities of plant and material may be diverted to American sources.

One might proceed for hours to deal with one facet after another of this fascinating subject, but my time is drawing to a close and there are many Authorities on the Indian market here to-day who, I am sure, would like to give us the benefit of their great experience. We are all agreed, I think, that the present position of the British export trade to India is one which gives ground for very serious concern, although we may not all concur in the remedies which I have outlined. I have deliberately refrained from making any reference to the political situation in India, firstly because it would be out of place for one in my position to do so, and secondly because I am firmly convinced that our difficulties spring from purely economic causes, and the remedies are those of rationalisation of production and marketing which can only be applied by manufacturers and merchants themselves. It is admitted that the political situation in India introduces a gravely disturbing element, which—inasmuch as it tends to impair confidence in the country—renders the application of remedial economic measures all the more difficult. I consider that the attitude of a section of the English Press in exaggerating the political crisis is responsible for the creation of a feeling of grave anxiety among many of our manufacturers which is scarcely warranted by facts.

One turns with feelings of gratitude to the sane and steady tone of the great organs of public opinion in India and to the balanced views of the commercial bodies on the spot, which, far more accurately, reflect the true state of affairs.

The British manufacturer stands to-day in the Indian market on the same footing as his foreign competitor. He does not enjoy any preferential tariff—in fact the Government of India are pledged to a policy of discriminating protection for Indian industries against the imported article—whether British or foreign. Moreover, the Government of India are determined to purchase their own requirements in the cheapest market and to give a substantial preference to goods made in India. He has, however, very great assets as a result of centuries of trading relations. British goods, British trading integrity and British character have a reputation second to none throughout the bazaars of India and the Far East. We hold the master cards in our hand if only we can play them as a hand so that each may secure its full value. The rationalisation of production must enable goods to be produced at a competitive price, the rationalisation of marketing must insure that these goods are distributed in the most efficient manner, and the rationalisation of finance must provide British capital where it is needed, either in the form of loans for railway, irrigation and power development in India, in backing for the promotion by private enterprise of public utility companies and other large scale economic undertakings, and in the provision of the long term credit facilities which are occasionally needed, but which our present banking system—excellent though it is for all short-term and exchange business—fails to provide.

I appeal to British manufacturers, exporters, and bankers to take a closer and more active interest in India's progress and economic development. The keynote of the future must be closer co-operation between all the interests concerned, both in the United Kingdom and in India. None of us who have intimate knowledge of conditions in India can ever doubt that, given a stable Government, the country must inevitably proceed with longer and surer strides on that path of economic development and prosperity along which she has already proceeded for no inconsiderable distance. I do not underrate the difficulties of co-operation with certain Indian interests in the present state of racial and political tension, but I believe that the economic field offers greater prospects of early co-operation than almost any other. The interests of the two countries are bound up in the development of an economically strong and prosperous India as an integral part of the British Empire. We have recently seen an unmistakable community of interest between the Lancashire and Bombay cotton industries in the face of Japanese competition. The steel industry would appear to present opportunities for combined action so that the Indian market may be developed to give the maximum scope for both the Indian and the British Industrialist. Is it too much to hope that we may be entering upon a period of Imperial rationalisation and co-operation between British and Indian industries to their own mutual advantage and to the general strengthening of the Commonwealth of Nations to which we both belong? Even though we may still be far from the realisation of such a policy let us make it a goal which we should keep clearly before us.

DISCUSSION

THE CHAIRMAN said that Mr. Ainscough had given a very able résumé of the position of British trade in India at the present time. The position was far from satisfactory. The reflection had occurred to him while listening to the paper, that, after all, the lecturer was talking about a problem by no means confined to India. In other Dominions and foreign countries the people were anxious to develop their own industries, and with that end in view had put up a tariff against British goods. Mr. Ainscough had quoted figures which showed the decline in export trade during the last few years. If the figures for the export trade with other Dominions and other countries were taken, exactly the same kind of thing would be found. Therefore, when the lecturer turned to deal with the remedies required, he was really again speaking, not of India alone, but of other countries with which Great Britain traded. He had listened with eagerness, as one specially responsible for assisting the trade of this country, to the suggestions which the lecturer had made. Since he had had occasion to study this question it had been impressed upon him that British export trade in India and overseas had to compete with the trade of other nations whose industries were more highly organised or had been what was termed rationalised to a greater extent than our own. Whether one liked it or not, it was undoubtedly, to his mind, the fact that the future was going to lie with those industries and those countries in which there had been a systematic rationalisation of industry. Another problem which was constantly before his Department and had been brought forward particularly in connection with the Goodenough Report, was the marketing of goods in countries overseas. He knew perfectly well that there were some who had not agreed with the criticisms that the Goodenough Report made on British marketing methods. He noted with interest that the lecturer himself referred to certain very successful plans which had been already instituted in regard to the marketing of British goods in India. He gathered that the lecturer considered that in certain trades in India, at any rate, this was not the special problem which had to be considered; nevertheless it remained a problem in some of the smaller and less organised trades. In the third place the lecturer approached another problem which again they had to encounter in other fields, namely, the question of finance. He had referred to the difficulty that had arisen also in regard to other countries owing to the fact that our banking system, efficient as it was in regard to short credits, did not seem to supply the needs of traders who wanted to compete with America and Germany. In America, at any rate, it was possible to provide loans for longer terms, for four, five, or seven years, and facilities of this kind were in some cases desirable in order to sell British goods overseas.

The lecture had been an exceedingly able one in its survey of present conditions and prospects. He noticed with interest the reference the lecturer had made to the new custom that had come into being of inviting Indians to join Boards of Directors. He could not help feeling that it would be for the benefit of British trade in India to cultivate closer relationships between the two peoples in this way. He wished entirely to endorse what the lecturer had said in expressing regret at the newspaper campaign, which had tended to exaggerate the position in regard to the unsettlement in India. It always had to be borne in mind that a very intimate relationship existed between these great political questions and industry, and it was extremely important that those responsible for circulating information should be sure that the information was accurate and not misleading. The prejudicial effects of exaggeration were evident; they bore not only on the relationship between the two peoples, but upon the fortunes of industry as well. There were many present who were more closely connected than he could claim to be with the trade of India, and he hoped that some of them would join in the discussion.

MR. J. G. NICHOLSON (Director, Chemical Industries, Limited) testified that from his own personal experience in the business with which he was connected the lines of organisation suggested in the lecture were those which had been found to be successful. But he was sorry that the lecturer did not lay a little more stress on the necessity for industrialists at home to realise the absolute necessity of keeping stocks continually on hand. It was not of very great value to be able to sell British goods in the native bazaars unless, as soon as they were sold, the goods could be immediately replaced by other supplies. Stocks should be laid down so that they could be sold at a non-varying price as far as possible, having regard to the rate of exchange. He was sorry also that the lecturer did not enlarge more upon the necessity of an extremely wide distribution of goods. After all, India was an enormous country. In the business with which he was connected there were 700 widely distributed centres in India from which the Indian could draw what he required in the way of supplies, and the price was fixed. There were inspectors going round to these places continually, and as a result of these methods the trade had increased during the last three years for a particular material sold in the bazaars from 62,000 tons per annum to 65,000 tons per annum in the second year, and last year, to 72,000 tons per annum. He was speaking of a material which was sold in the bazaars—to use an expression applicable to this country, though not to India, sold “over the counter.” It was not an industrial product; that is to say, although industrial in this country it was not used industrially in India. The same thing applied in the case of the distribution of a certain fertiliser. The organisation started with 700 people to carry this fertiliser for sale in India, but last month over 2,000 persons were so employed. He wished to add a reference to the German competition in respect of dyes, a product in which his concern took a great interest. The Germans were by no means having it all their own way, as perhaps they did a few years ago. He would not furnish the percentage figures for dyes because they might be misleading; it was easy to get an increase of 100 per cent. in a matter of tens but harder in a matter of thousands, but he would content himself with the general remark that the German trade would not any longer increase at the expense of British trade so far as dyes were concerned. He desired to say again how entirely he was in agreement with the lecturer's suggestions for a wide distributing organisation, carefully looked after, with stocks available from which the Indian could buy.

SIR WILLIAM J. LARKE, K.B.E. (Director, National Federation of Iron and Steel Manufacturers) said that he had a long acquaintance, both personal and official, with the lecturer, and his lecture certainly bore out exactly what he would have expected from him as a comprehensive review of the position in India. He desired, before commenting on the paper, to add his testimony as an industrialist who had had official relations with Mr. Ainscough for many years, and to say how grateful he and those with him were to Mr. Ainscough for the remarkable services he had rendered to British industry and commerce in India since he had occupied the position of British Trade Commissioner. If any argument were needed for the further development and expansion of the Department of Overseas Trade, over which the chairman now presided, he could not do better than refer to the work which Mr. Ainscough had done in India. As an industrialist in one of the depressed and heavy industries, the speaker gladly bore his testimony to the efficient help the Trade Commissioners rendered to those industries, and he expressed the hope that some day a British Government would arise, which, realising that the great interest of this country was a prosperous industry, based on an ever-expanding export trade, would make the Department of Overseas Trade not an appendage of another department but one of the most important departments in the bureaucratic hierarchy.

He was interested in the lecturer's suggestion that there was in fact a new opening in India for British enterprise. He was quite right in recommending traders to develop new lines of products, not to interfere with their old standard of quality, but to realise that India was still, and must be for some time to come, largely a price market. They must realise that it was their business, if they wanted trade, to satisfy the needs of the market as they found it. The needs of the Indian market, with 320 millions of people, were enormous. The time would come when India would cease to be a purely price market and would become a quality market, and it was their interest to assist India to that goal by increasing the purchasing power of her people.

A good deal had been said about rationalisation of industry and the necessity of providing India with finance. British finance could only be furnished to India or any other market if British finance were based on a prosperous British industry. The two things were absolutely and indissolubly interlocked. The depression in British industry was not due to British failure to compete in India and other export markets; it was due to something quite different, namely, to the handicaps placed upon British competitive power due to post-war problems.

With regard to the criticism of selling methods, he was very glad as one actively engaged as an industrialist, selling direct to the consumer, that the lecturer had at last explained what so many of their critics had failed to realise, that when Britain ceased to be the only great industrial nation and others competed with her industrially, those others found the British position so strongly entrenched in the world markets that the only means of displacing Britain was to develop the art or science of technical salesmanship, propounding the virtues of their goods through those instructed in their production and use. It was certainly true that British traders had not always replied to that attack as they should have done in spite of many brilliant exceptions. Many of the big Merchant concerns now had experts attached to them to deal with technical matters on the spot. He himself had been identified with industries which had developed organisations involving technical selling, and this work needed to be developed still further.

The lecturer had referred to the iron and steel industry. He would like to assure him that the British iron and steel industry was taking the same steps to ensure that foreign competition was met by technically instructed and informed selling agents. In India it was prepared to give the requisite technical advice in the use of its products, as it was in other markets. This organisation was not yet so complete in India as in other markets but export selling had been organised on a national and representative basis.

With regard to co-operation with the iron and steel industries of India as represented by the great organisations which the lecturer had mentioned, the iron and steel industry in this country had the most friendly relations with them, which he hoped were steadily developing towards the economic recognition of the position of each. India's present demand and productive capacity could hardly be expected to cover effectively the whole of the needs of that enormous community in respect to the multifarious products characterised as iron and steel. Great Britain, on the other hand, being the birth-place of the iron and steel industries of the world, had originated most if not all of those products, and had been supplying them to all the export markets. It followed that British industry was able to supply some of these products more efficiently than any industry newly starting could expect to do until it had gathered the necessary experience and until the demand of the community had risen to a certain volume. Certainly the desirable thing was to have co-operation to their mutual advantage. It must be taken for granted that as India and the

other Dominions increased in their material prosperity by the development of their industries, the industry of this country would also benefit. He wished to add his thanks to the lecturer for an extremely able review of the situation, and to say how glad he was to know that British commercial destinies in India still remained in his charge.

MR. G. E. ROWLAND (Chairman, Agricultural and General Engineers, Limited), after also paying a tribute to Mr. Ainscough for the excellent service and assistance which he had given to an Indian organisation which the speaker helped to establish some time ago, said that he had long been convinced that the Department of Overseas Trade should as quickly as possible change its name to that of the Ministry of Commerce, providing an organisation similar to that which their American competitors had so long enjoyed.

If he might sum up the paper, he would say that it put forward the need for rationalisation of production, of marketing and of trade. The question of finance was wedded to each of these, and he was convinced that if the organisation overseas was to be given the assistance which it required it was necessary for manufacturers to come together, to standardise their production, and to bring down their costs. They must also bring their plants up to date. He hoped that this Government and succeeding Governments would continue to render financial assistance on easy terms to firms which were endeavouring to work in this direction. Some time ago his own group associated itself with a concern in the Dominions and also with a competing firm in this country, and he expressed on that occasion the wish that other competitors would join the group and so for this particular industry make a strong attack against American competition. It was useless for a small concern, working on a 5 per cent. margin, to compete alone in these world markets, but by a generous policy on the part of the larger manufacturers a determined effort should be made to rationalise each of the smaller industries and so give them a chance to live.

MR. H. A. F. LINDSAY, C.I.E., C.B.E., I.C.S., after joining in the tribute to Mr. Ainscough for an illuminating and inspiring lecture, said that he had had the privilege of knowing the lecturer for many years, in fact they were colleagues in Calcutta. It was the function of a Trade Commissioner on the one hand to push and on the other hand to pull. He pulled the trade of his own country towards him, and he saw that his friends at home pushed it from the other end. While Mr. Ainscough was doing that in regard to British trade he (the speaker) was trying to perform the same office in regard to Indian trade and to push from the Indian end. They worked in the closest co-operation, and he looked back with great pleasure to the days they spent together.

There was only one very humble contribution which he had to make that evening, and he would make it from the standpoint of an exporter of Indian goods. They all recognised in India that "where you buy, you sell," that is to say, in buying British goods they were strengthening one of their best customers. The credits which were set up by the purchase of British goods were used in their turn for the purchase of Indian goods, and they were very anxious to extend their markets as widely as they could and looked forward to a closer trade with Britain and an increased exchange of its goods for their own. One thing which had struck him very forcibly was that modern trade conditions did not seem to require quite such heavy stocks as was the practice in the past. He differed here from what a previous speaker had said. He had found that stocks were very widely reduced, and perhaps such

reduction of stocks accounted for the closer touch now existing between the producer and the consumer and the more serious fluctuations of price. Violent fluctuations occurred almost from day to day, at any rate from month to month, and one of the reasons was that dealers were not able to hold the same quantity of stocks as they used to do in the old days. He was thinking particularly of the piece goods trade in India. In that trade the amount of stocks held to-day was very much smaller than formerly, with the result that any shortage was shown at once and any excess was also revealed in lower prices. He remembered that during the war, when there was a very serious shortage of cotton piece goods, the reason was found to be that the bazaar—and when he said the bazaar he meant the whole line of traders from the importer up to the final retail seller—was accustomed to trade on stocks representing $2\frac{1}{2}$ years' supply, and that these stocks had been reduced to something like an 18 months' supply, which was regarded as a very low volume indeed. But nowadays the position was materially changed. Stocks were so greatly reduced that the producer and consumer stood in very much closer relations than they used to do, and he believed that this had a great deal to do with the fluctuations of price which occurred.

SIR WALTER S. J. WILLSON (formerly Member of the Indian Legislative Assembly) said that there was no person more consulted by the merchants in India than Mr. Ainscough. The merchants there studied all his writings in order that they might gather information as to pushing their trade. It would be a very good thing if the lecture were reprinted in every trade paper in this country. The wider circulation and publicity it received the better for Indian trade. He would like to say one word on the question of advertising, which might be important. The cinematograph was a very good system of advertising in India. Any traders who were considering how to push their goods in that country should give it their consideration. The most striking omission from the lecture—not unnatural owing to the fact that the lecturer was a Government servant—was any reference to the fact that one of the greatest difficulties in pushing British trade in India at the present time was that taxation in Great Britain so enormously increased the price of the manufactured article. He had been interested for many years in the distribution of a certain British product in India, but the trade had not been able to maintain its ground simply because of the high cost of manufacture, which the high cost of coal and taxation in this country increased. The trade had been definitely handicapped on that account.

SIR JAMES SIMPSON, late M.L.A., said that, like many of the previous speakers, he had enjoyed the lecturer's friendship for many years. He had sat opposite his genial and expansive countenance on many occasions in India, and he had been prepared for the ability and illumination of the present lecture. The lecture had been as full of good things as an egg was of meat. One point to which he wished to refer was the necessity that things must be cheap. As one who had served for over 30 years in the South of India, dealing with the very articles that the lecturer had referred to, what were vulgarly called in the trade "muck and truck," and having come to London quite recently to take charge of the business at this end, he met the constant cry that the things must be cheap. But that did not necessarily connote that they must also be nasty. On the contrary, as the lecturer had said, a thing could be cheap and attractive.

It was very difficult, in fact, almost impossible, to keep politics out of business nowadays. Mr. Ainscough had referred to the great potentialities of Indian railway and other securities. All these had come down in value very greatly of late, along with all other securities the world over. He was informed that the decline in India was not due to the fact that British merchants were removing capital out of the

country, but he was told on good authority that it was owing to forced sales by holders in Great Britain who had got the "wind up" because of the political situation in India. That was a very unsound and unsafe position for holders to take up. They should not throw away good securities in this fashion. After 32 years in India he was an optimist, and he felt that the present position was a phase which would very soon pass, and then these securities would appreciate again in value, and those who had sold them would regret their hasty action. Not long ago he listened on the wireless to a talk by Mr. Ainscough who began by saying, "India is the brightest jewel of the British crown." Some of them who had spent the whole of their lives in India were convinced that India would continue to deserve that description.

MR. AINSCOUGH, in replying on the discussion, said that the hour was late and he did not wish to detain the audience much longer. He had been deeply touched by the remarks which had been made, all too flattering, by his old friends both in England and India, whose presence there that day was a great compliment to himself. It was a great source of satisfaction to overseas officers to realise that the efforts they were making—and which it was their duty to make—were appreciated by the great industrial interests whom they endeavoured to serve.

It was difficult to select the various questions which had been raised that evening. The subject was so vast that one could proceed from one facet to another for hours. Sir Walter Willson had touched upon one feature of the question which he personally had very much at heart, but which he had not been able to refer to in the paper, namely, the question of advertising. Advertising in India was in its infancy. At the time he went out there, 12 years ago, he made up his mind that everything possible should be done to induce the great advertising firms to take more interest in the market and to develop what was largely a virgin field. It had been a source of great satisfaction to him that during the last few years two or three of the leading firms in Fleet Street, representatives of whom he was very glad to see present, had recently established their own organisations in India and were doing very valuable work in assisting the distributing activities of the industrial merchants.

He was very glad to learn from Sir William Larke that the settled policy of the British steel trade was to work in close co-operation with Indian steel producers. As he stated in the lecture, he considered, the facts of the case being what they were, that the steel industry was one which in India offered the most promising prospects for closer interest between the two countries.

Mr. Nicholson had raised many points in connection with stocks and otherwise, with which there was not time to deal at the moment. He would only say that he very much appreciated his support, in-as-much as the great firm which he represented, Imperial Chemical Industries, was one of the very first in the Eastern markets to inaugurate that extensive method of distribution which had been found to be so successful. The method was started, he believed, from one of the most difficult markets in the world, namely, the China market, and the methods found successful in China had recently been applied to the problem in India.

THE CHAIRMAN said it only remained for him to express on behalf of the Section their warmest thanks to Mr. Ainscough for his very interesting address. Mr. and Mrs. Ainscough were leaving for India in a few days, and all present would unite in wishing them God speed on their journey, and that Mr. Ainscough would remain for many years as the trade representative there to foster friendly relationships between Great Britain and India.

The vote of thanks was carried unanimously, and on the motion of Sir William Larke a vote of thanks to the Chairman was similarly carried.

ART EXHIBITIONS

EXHIBITION OF THE NATIONAL SOCIETY OF PAINTERS, SCULPTORS, ENGRAVERS AND POTTERS. At the Grafton Galleries.

The catalogue of the first Annual Exhibition of the National Society of Painters, Sculptors, Engravers, and Potters, begins with a brief introduction, which says that the formation of the Society was due to a "growing desire among artists of every creed and outlook for an Annual Exhibition which would represent all aspects under one roof, without prejudice or favour to any one." The idea is excellent. There is every man's meat here, and every man's poison. We are not obliged to sit down to what we know we cannot digest, so no harm is done.

I dare say that if all goes well with the Society future years will see a considerable development of its ambition. To-day there are nearly a hundred and fifty members, but of these the great majority show pictures; a handful are sculptors, and only four are potters, namely Messrs. Bernard Leach, Staite Murray, Charles Vyse and Miss Gwendoline Parnell; certainly a select quartet. But there is some lack of proportion here. Must we continue to have three year intervals between the exhibitions of the Arts and Crafts Exhibition Society, or could not some alliance be arranged between these two organisations, so as to make it possible for the public to enjoy and profit by annual comprehensive shows of work by our best craftsmen in all departments?

Mr. Leach is a master of quiet design, cool colours and apparently artless, but really very clever patterns. Nothing shown by Mr. Vyse or Mr. Staite Murray is on a lower level. Four painted tiles by Mr. Staite Murray treated as one composition and framed for hanging, are particularly attractive. (Flower Basket, 488).

Among the sculptures, notice Mr. Dobson's "Standing Figure," 471. Among the pictures, see especially 133, the Dowager Lady Airlie, by an old hand, Sir John Lavery; and another portrait, by a young hand, Mr. R. O. Dunlop's 159. Mr. Dunlop's one landscape is also among the best of the pictures shown.

EXHIBITION OF STONWARE by D. K. N. Braden and K. Pleydell-Bouverie. Galleries of W. B. Paterson, 5 Old Bond Street. Till May 31st.

It comes as a surprise to realise that this is the first one-man, or rather two-woman show by the Misses Braden and Bouverie. What one has already seen of their work in the last two years has left such a pleasant impression of beauty and soundness that one has tended to think of them as having in all senses arrived. Artistically and technically they certainly *have* arrived, though they themselves would protest that they are still only in an experimental stage of their development. What *I* mean to say is that the work they show is good in itself; what *they* mean is that further experience will enable them both to do more, and to do again what they have already done with greater sureness and less waste.

For the method of alkaline-glazing stoneware has not so far been widely used in Europe, the various wood-ashes not having yet been thoroughly investigated for purposes of glazing and colouring. The Misses Braden and Bouverie are pioneers in this direction, and pioneers who know how to consolidate the ground they have won. Their main designs are almost uniformly simple and good, in a manner that we nowadays call "chaste." The majority of their pieces have a comparatively low glaze, but some of their medium sized brown jars are more highly glazed. The

prevailing tone of blue-grey is charming ; one feels it must wear well as part of most normal, sensible decorative schemes. Here and there we get a marked *craquelure*, but in the main this is not a striking feature of the collection.

As to pattern, the Misses Braden and Bouverie prefer to adorn their pieces (when they *do* adorn them) with colours related both in point of composition and colour to the body of their productions. The designs are either quite formal or simply naturalistic, never intricate or over ambitious.

These two ladies do their work in a mill in Wiltshire ; they apply themselves strenuously, and, as all may see, effectively, to their task.

The Exhibition will remain open until May 31st.

MEETINGS OF OTHER SOCIETIES DURING THE ENSUING WEEK.

MONDAY, MAY 26. Architects, Royal Institute of British, 9 Conduit Street, W. 8 p.m. Mr. C. Leonard Woolley, "Recent Excavations at Ur."

University of London, at the London School of Economics, Houghton Street, W.C. 6 p.m. Prof. C. Burt, "The Measurement of Mental Capacities." (Lecture I.)

At University College, Gower Street, W.C. 5.30 p.m. Prof. Sir F. Petrie, "Recent Discoveries at Beth-Pelet, Palestine."

Victoria Institute, at the Central Hall, Westminster, S.W. 4.30 p.m. Mr. Israel Cohen, "The Jews under the Palestine Mandate."

Anthropological Institute, 52 Upper Bedford Place, W.C. 8.30 p.m. Mr. W. Page Rowe, "Art and Anthropology."

Physics, Institute of, at the Institution of Electrical Engineers, Savoy Place, W.C. 5.30 p.m. Dr. W. H. Eccles, F.R.S., "The Influence of Physical Research on the Development of Wireless." (Presidential Address.)

Quekett Microscopical Club, at 11 Chandos Street, Cavendish Square, W. 7.30 p.m. Special Pond Life Exhibition.

University of London, King's College (at 40 Torrington Square, W.C.) 5.30 p.m. Dr. J. Krzyzanowski, "Joseph Conrad," Lecture II—The Polish Element in Conrad's Work."

At University College, Gower Street, W.C. 5.0 p.m. Dr. Lythgoe, "Special Sense Physiology." (Lecture IV.)

WEDNESDAY, MAY 28. British Academy, at the Civil Service Commission Building, Burlington Gardens, W. 5 p.m. Dr. W. Macneil Dixon, "Chatterton." Geological Society, Burlington House, W. 5.30 p.m.

University of London, at King's College, Strand, W.C. 5.30 p.m. The Rev. Professor H. M. Relfon, "The Idea of the Church and the Sacraments. Lecture I—The Nature and Function of the Church."

University of London, at the London School of Economics, Houghton Street, W.C. 5 p.m. Prof. J. Redlich, "Local Government in the Republic of Austria."

At the School of Oriental Studies, Finsbury Circus, E.C. 5.30 p.m. Mr. W. P. Yetts, "Chinese Bronzes. Lecture II—Inscriptions on Archaic and Later Bronzes."

THURSDAY, MAY 29. Chadwick Public Lecture, at the Chelsea Physic Garden, Swan Walk, Chelsea, S.W. 5 p.m. Dr. Arthur W. Hill, "Cabbages and Kings."

University of London, at University College, Gower Street, W.C. 5 p.m. Dr. Lythgoe, "Special Sense Physiology." (Lecture V.)

At University College, Gower Street, W.C. 5.30 p.m. Dr. A. M. Bassani, "Venezia."

FRIDAY, MAY 30. Aeronautical Society, at the ROYAL SOCIETY OF ARTS, Adelphi, W.C. 6.30 p.m. Mr. H. R. Ricardo, "The Development and Progress of the Aero Engine." (Wilbur Wright Memorial Lecture.)

Geologists' Association, at University College, Gower Street, W. 7.30 p.m. Mr. Sidney Hall, "A Study of the Coastal Geology between Marazion and Porthleven, Cornwall." Messrs. W. G. Shannon, D.Sc., and L. G. Anniss, "The Igneous Intrusions of the Stoke Fleming Area, South Devon."

Royal Institution, 21 Albemarle Street, W. 9 p.m. Sir H. C. Harold Carpenter, "The Metal Crystal."

University of London, at King's College, Strand, W.C. 5.30 p.m. Mr. R. Byron, "The Syrian Christians of Travancore."

At King's College, Strand, W.C. 5.30 p.m. Prof. D. Saurat, "Le Développement de l'esprit moderne dans la littérature Française: Vigny, Baudelaire, etc."

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No. 4045

FRIDAY, MAY 30th, 1930

VOL. LXXVIII

*All Communications for the Society should be addressed to the Secretary, John Street,
Adelphi, W.C.2.*

NEWS OF THE WEEK

"What I lament is the importance of head lines and the unimportance of head work."

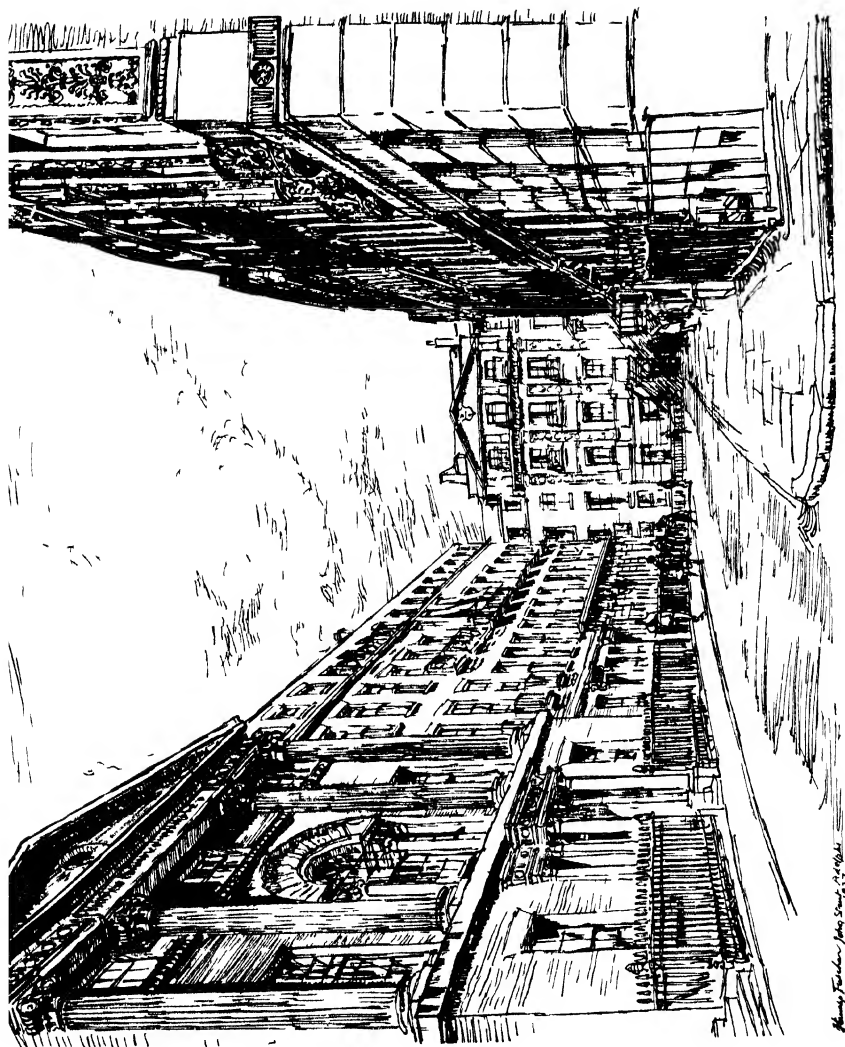
G. K. Chesterton.

"If you regard Art as a luxury, what a queer, drab world you are building up for yourselves and posterity."

Lawrence Haward.

Advertising.—We must apologise for quoting Mr. John Gloag's admirable note on "The Artist and Industrial Art" under the name of John Elvay. Looking at Mr. Edmund J. Sullivan's beautiful picture, "Faith," advertising Messrs. Drages in many papers this week, we were reminded of the quotation from Mr. John Gloag's words in the *Architectural Review*—"Only in one field is the artist allowed anything approaching a partnership in business, and that is in the marketing of goods." The connection between the Faith of the Pilgrim Fathers and the virtue applied to the hire system has produced a beautiful example of Mr. Sullivan's art. When is the consummate art of his illustration of books to be recognised in this country? His great French Revolution and Sartor Resartus are a joy to all who love noble books.

Books.—"A NATIONAL THEATRE," by Harley Granville Barker. Elsewhere in this issue will be found a discussion on the interesting book by Mr. Granville Barker on the subject of a National Theatre, which is being so much discussed at present. For many years he has been the pioneer of the scheme, and with the late William Archer he worked out every detail of the plan, cost and running



John Street, Adelphi, showing the Society's House on the left.

Henry Fowler, 1895, 1904

of the theatre. His work has been magnificent, but there is just one criticism we should like to make on the subject of theatre schemes in general; we cannot help thinking that the initial cost is so enormous—the authors always allow for the salaries of the humblest supers—that it is rather calculated to frighten the uninitiated. Granted that in a State theatre of this sort it is necessary to have a detailed account of the probable expenditure, but surely much could be done in the way of a National Theatre without the hundreds of thousands which seem to be necessary in such a scheme as Mr. Granville Barker's? One of the most significant little theatres in London to-day was started with about fifty pounds and a small upstairs room, if information is correct! Of course, this is not comparable to an official scheme for a National Theatre, but we cannot help thinking that if it could be contemplated at a slightly smaller initial expenditure it would not only appeal more to the general public, but to the Chancellor of the Exchequer and the would-be supporters of the scheme! Mr. Granville Barker naturally aims at the perfect theatre, but to get it started seems the most important thing at the present moment.

The Wedgwood Festival.—We are looking forward to Mr. Harry Barnard's (Etruria Museum) paper on Josiah Wedgwood. The Potteries have a great week, celebrating the centenary of this Master Potter. We recommend Mr. Barnard's admirable little book "Chats on Wedgwood Ware" to every one interested in the man who made this branch of Industrial Art a Fine Art.

It is gratifying to know that the Society's Rooms were crowded to hear Mr. Harry Barnard's paper on "The Founder of English Pottery—Josiah Wedgwood, F.R.S., Potter, Inventor, and Man of Science." Messrs. Heal have an exhibition of fine Historic Pieces of Wedgwood opening this week at their beautiful Mansard Gallery, so that Fellows of the Society who were unable to attend the lecture will be able to see fine specimens of Wedgwood Ware in London, and read Mr. Barnard's paper in *The Journal* next week.

Epstein Exhibition at Knoedler's.—One great advantage about the present Epstein is that he has got past the stage of delighting in mud slinging criticism, for though he is too much of an artist to pander to any public, yet one cannot help thinking that the public themselves by their narrow-minded protests rather goaded him on to greater extremes than deterred him from his experiments in stone. At Knoedler's Gallery he is showing his "Madonna and Child," and if it were not for the title it would be easier to give it whole-hearted admiration, but whereas no mere title should make any difference to a work of art, in this case it is all part of a certain iconoclastic tendency which one feels throughout Epstein's work. The greatest artists through the ages have idealised the Madonna without in any way detracting from reality, and it has been a kind of spiritual homage, but here is a thin sensuous tortured spirit, with a

strange ugly child "of the earth, earthy." The drawings are brilliant, some unpleasant, all monotonously ugly.

Drawings by Hanslip Fletcher at the Foyle Art Gallery.—This group is exhilarating and disappointing. Mr. Hanslip Fletcher's sketches of old London are well known and there is no one else who has quite such facility in getting topographical accuracy and yet such delightful drawing, and we owe him a great debt of gratitude for his love of relics, what he calls "Changing London," and his excellent records of what will, alas, soon be the beauty of the past. This exhibition in itself is a reminder of old neglected corners, beautiful old inns and shops going to rack and ruin—city churches surrounded by the builder's paraphernalia of destruction and the changing face of every corner of our city. The disappointment in this exhibition is that doing such very excellent work the artist does not reach real distinction. He is too much of a journalist in his drawing—perhaps he draws almost too easily—and there is sometimes a monotonous absence of tone value and the vitality of the picture is sacrificed to its accuracy. One or two of the more sketchy exhibits are the most successful, as, for instance, Nos. 19 and 22, but our gratitude for these beautiful old corners of London must outweigh any criticism, and it is certainly an exhibition well worth seeing. We show an example of his work, illustrating John Street and the building of the Society therein.

Theatres.—"THE UGLY DUCHESS" AT THE ARTS THEATRE.—It is difficult to understand why this play has not received more notice, as it really has the makings of a most excellent drama. Nothing, however, is more destructive than too many intricate plots and subsidiary characters, and these came near to destroying the central plot which is really a very excellent one. Nothing could be more dramatic than the contrast and rivalry between the ugly Duchess Margrete and her rival Agnes von Flavon, who, with her beauty, seduces both the Duchess's husbands and eventually turns both her son and her kingdom against her. These two characters were excellently played by Miss Esme Beringer and Miss Minnie Blagden. Miss Beringer, of course, bears most of the burden of the play, and very splendidly she did it, though the character might have gained if she had given it occasionally a little more charm. Henry Hallett makes an excellent study of her tragic consort, and Mr. O. B. Clarence extracts much delight from a very small part. The last curtain would have been fine, but for the introduction of a "gnome," which destroyed the whole atmosphere and made the end ludicrous.

It seems a pity if such a very excellent production is allowed to disappear merely for the want of some drastic pruning. There are few enough plays now with real drama, and on a larger stage more might be made of the setting and the dresses, for which there is every opportunity in the fourteenth century!

Willingdon By-pass Road.—Particulars of what appears to be another instance of the avoidable desecration of the country-side are given in the following extract from *The Daily Mail* :—

Willingdon, a picturesque Sussex village near Eastbourne, is up in arms against what its Vicar, the Rev. G. F. Handel Elvey, describes as “an act of diabolical tyranny.”

The “tyrants” are the Ministry of Transport, the East Sussex County Council, and the Eastbourne Corporation. The two local authorities have put forward a scheme for a new by-pass road to Eastbourne passing through Willingdon, and so close to the 800-years old church that church land will have to be acquired for it. The scheme was hotly opposed at the Ministry’s inquiry, but the department has sanctioned it.

Willingdon is preparing a great petition of protest.

Mr. Elvey, in a statement to *The Daily Mail*, points out that the decision to build the road was only secured by narrow majorities on the County Council and the Eastbourne Corporation, and at the public inquiry the mass of evidence was against it. He says :

“We claim that a 60ft. road on a sharp gradient, and a dangerous cross-roads within a few yards of our church will destroy the amenities of worship. The gradient will necessitate heavy vehicles and low-powered cars using low gear, and the cross-roads will necessitate continuous horn blowing. The traffic to and from Eastbourne on Sundays is tremendous.

To take Church land for a purpose hostile to the Church is surely an act of diabolical tyranny.”

It is further urged that the road will deprive school children of part of their playground and will ruin one of the most beautiful spots in Sussex. Finally, it is said that the proposed road will only temporarily meet the situation ; a bigger scheme will have to be embarked on later. Willingdon asks : Why not save our village by doing the big scheme now ?

As Mr. Briant Poulter, F.R.I.B.A., a Fellow of the Society and Chairman of the South Eastern Society of Architects (Croydon Chapter), who brought the matter to our notice, epigrammatically remarks in a letter on the subject addressed to the Vicar of Willingdon, “Beautiful country makes good citizens.” It is refreshing to recognise this expression of the old Greek truth, taught by Plato more than 2,300 years ago, which we have nearly forgotten—our Local Authorities quite forgotten perhaps. Mr. Poulter’s comments are much to the point :

I am a strong believer in surroundings affecting the community. Beautiful country makes good citizens. I know this to be a difficult subject to put before the people and it would appear that the only way to save the countryside is by education.

After visiting foreign countries and the Colonies with their vast expanses of uninteresting lands, one comes back to England to realise what a wonderful little garden it is and the duty we have to retain its character.

A point which occurs to me is, will these concrete “Racing tracks” always be required ? Flying is making rapid progress and there may be different forms of transport before many years. Is any authority justified in demolishing our rapidly diminishing beauty spots for the present demand for speed and noise ?

If the present conditions be allowed to continue, every thing of beauty will be

sacrificed and we shall be deprived of a national asset. Many rich foreigners come here to enjoy our beautiful country and spend money with us, but will they come if the whole place is turned into a network of speedways fringed with hideous bungalows? The answer is clear. No.

It is fatally easy for insensitive bureaucratic bodies to destroy in a week or two the quiet charm which it has required centuries to create. Our good wishes go to the villagers of Willingdon for the success of their petition, which we hope will meet with the sympathetic consideration which it deserves.

A NATIONAL THEATRE

Mr. Harley Granville-Barker's book "A National Theatre" ("A National Theatre," by Harley Granville-Barker, Sidgwick and Jackson, 6s.) is published at an opportune moment. It is no secret that the Prime Minister, Mr. Ramsay MacDonald, would like to see a National Theatre established in London during his term of office, and there is no doubt that, consistent with his other multifarious duties, he would actively help in its foundation. But this is no more than the Nation has a right to expect of any Prime Minister of whatever political party, and alone it would not be a decisive factor. The time is favourable for other reasons. In his admirable book which summarises all the efforts of the past twenty-five years and marshals all the evidence in support of a National Theatre in so conclusive and overwhelming a manner that no serious objection is left on any ground, Mr. Granville-Barker says:—

"A National Theatre not being a Hospital, nor a scientific institution nor out to provide the public with anything but spiritual benefit, the saving of £1,000,000 by public subscriptions will be a pretty formidable task. Not with our traditions and with the national finances as they are now and are likely to be for a generation, does one see a Chancellor of the Exchequer putting such an item nakedly into the Budget. But, admit that the taxpayers could not be so plumply asked to provide the money, there is still a source available . . ."

Mr. Granville-Barker then goes on to describe the activities of the British Broadcasting Corporation. The advent of broadcasting has entirely changed the situation. The B.B.C. distributes drama and music to the multitude and it has found that the multitude wants good drama and good music and will pay for it. It has the privilege of charging 10s. per annum for a wireless licence. For this 10s. per annum the subscriber gets the drama and music broadcast to him every day of the year. Of this 10s. the Post Office takes 12½%, the Treasury retains 10% of the first million licences, 20% of the second million licences, 30% of the third million licences, and 40% of all in excess of three million licences. The fourth million will soon be reached, but for the last three years the Treasury and the Post Office have received just under a million pounds sterling from their percentages of licence fees.

In spite of paying these percentages, the B.B.C., after paying all expenses, including fees, had a balance in 1928 of £123,181 4s. 1d. well-earned profit. So here we see that through the B.B.C. the revenue needed to maintain a National Theatre is easily available. One should go further and add that since the B.B.C. must have drama and music to supply to its audience—since that is what its audience pays its licence fees for—a National Theatre will soon become a necessity.

The next problem was the problem of the site. There was a suggestion at one time that the National Theatre should be somewhere near Grosvenor Gardens, but as Mr. St. John Ervine wrote in the *Observer* :—

“To place any Theatre in Grosvenor Gardens is as sensible as it would be to put one in Threadneedle Street. In New York the congestion of traffic in theatreland is so terrible that the Commissioner of Police asserts that there is only one way to cope with it, namely, to scatter the theatres.”

Mr. St. John Ervine then proceeds to point out that the Foundling Hospital site is free from all these disadvantages. In December, 1927, a meeting of the Shakespeare National Theatre Committee and the University of London was held, and it was agreed, and a resolution was passed that, subject to the money being available, no more suitable site could be found in London than the Foundling Hospital site, especially in view of the development of Bloomsbury as a centre for the University of London. The obstacle was that nearly half a million was asked for the site. This obstacle is now possibly also overcome. Through the extraordinary munificence and public spiritedness of Lord Rothermere the Foundling Hospital site has been bought to preserve it as an open space and a playground for children.

A plan will show how a National Theatre fully satisfying all Mr. Granville-Barker's most exacting requirements for two (a large and a small) auditoriums and storage space could be built on the Foundling Hospital site, leaving the magnificent open space in front of it as a playground for children in accordance with Lord Rothermere's wishes. Two sides of the surrounding square, I am informed, have recently been acquired by the University of London and the Pharmaceutical Society, so that the National Theatre would be in the centre of London's principal educational area, perfectly accessible by tube and 'bus, and in a non-congested area.

If Lord Rothermere would give his consent to the use of part of the Foundling Hospital site for a National Theatre—and he would, no doubt, do so as his chief interest is in preserving the amenities of that district and improving it—then the National Theatre Scheme as planned by Mr. Granville-Barker is immediately practicable. Site and revenue are available. It only remains for the promoters to get together and put the scheme into operation. Lord Rothermere should be approached and the Government should be asked to agree to the allocation of a percentage of the B.B.C. licence fees towards the establishment of a National Theatre.

PROCEEDINGS OF THE SOCIETY

NINETEENTH ORDINARY MEETING

WEDNESDAY, 2ND APRIL, 1930.

PROFESSOR CHARLES H. REILLY, O.B.E., M.A., F.R.I.B.A.,
in the Chair.

THE CHAIRMAN, in introducing the lecturer, said he regarded his friend, Mr. Nathaniel Lloyd, as a great asset to modern civilisation. He was a link between architect and public, a link too, between the new architect and the old architect. He had written a great book, which was the standard work on English Brickwork. He lived in a house by Sir Edwin Lutyens and, stimulated by that great architect, he had made a study of the traditional and almost instinctive craftsmanship which was, he thought, one of the great factors of our beautiful native, domestic architecture. It was that craftsmanship which was the ambition of other countries, and especially of our cousins across the Atlantic; a craftsmanship which, he was sorry to say, was gradually being lost in this country. A time would come, perhaps, when we should evolve a new craftsmanship, a craftsmanship of the machine, but till that was effective it seemed to him extraordinarily necessary that we should maintain the old instinctive craftsmanship wrapped up in the building materials of the country, in its cottages, its country houses, in all the things that enriched the countryside; and he believed that for hundreds of years the two would go along together. Much was being said about saving the countryside; ours was an age of preservation, and we were more bent on saving than making. It was more than ever necessary, therefore, that we should know the secrets of the old work.

Nevertheless he felt very strongly that there must be a second side to the movement for saving the countryside. We all had the negative side, we were convinced we must save the beautiful things our ancestors had made, but that was not enough; we must know their secrets so that the work of our time would compare with theirs. Of that craftsmanship Mr. Nathaniel Lloyd had made a special study.

The following paper was then read:—

BUILDING CRAFTSMANSHIP

By NATHANIEL LLOYD, O.B.E., F.S.A.

I wish Professor Reilly had gone so far as to define what we are to understand by craftsmanship. It seems to me that everybody has a different idea of what craftsmanship comprehends, but perhaps we shall be fairly safe in saying that "craftsmanship consists in doing work in the most direct way to obtain the best results. It shows intelligent appreciation of forms and of materials. It respects traditional methods of treatment but does not confine itself to these."

That is a very imperfect definition, but I sometimes wish that something of that kind could be imposed upon those modern innovators who are often heralded as heaven-born geniuses.

This brings me to another point, which is that I am quite unable to separate the designer from the craftsman. In mediæval times generally the designer and the workman were combined in one person, and often that is still the case. More frequently, however, the design is conceived and put on paper by one person, and the actual fashioning of it out of material is done by another. One, perhaps, works with pencil, paper, compasses and square; the other with compasses, square and cutting tools, but equally both may be craftsmen.

As it will only be possible to show illustrations on the screen for very short spaces of time I shall venture to point out to you little things which, given more time, you would certainly discover for yourselves, but which I am anxious should not be overlooked. In doing this I shall often refer to craftsmanship as indicating designing, that is, to craftsmanship other than that of the user of cutting tools; and, further, I shall assume that there may be some here who have little knowledge of architecture or building, and who would like to know something about their elements.

Scientists tell us that to no two persons looking at an object does it appear the same. Each person's conception is affected by his own personality and environment. When I regard some buildings that meet with people's commendation I feel that the picture from *Punch* of an estate agent sketching is not so very far from the mark as it might appear to be. I suppose at some time or other we have all gone to a house agent when seeking something, and often the descriptions by the agent as to how he regards the house he offers us do not exactly tally with our own impression of it. However, I want to take this point seriously as well. Actually I think we should be very much surprised if, standing by a friend looking at a building, we could see, as it were, that building projected upon his mind. We should find the building looked very different from what it does to us, and perhaps that will make us judge less harshly some opinions which are frequently expressed as to the merits of buildings and on architectural matters where we differ from our friends.

There is one kind of building upon which I think everybody is agreed, as the cottage now on the screen, the intimate, homely quality and native charm of which captivates all observers. It is in West Sussex, and was probably occupied by some yeoman. Here is another, a Palladian house at Burford, in Oxfordshire, which is equally admirable but more complicated in its design and requiring some study and knowledge of architecture properly to be appreciated.

We will begin by taking that too common object of the wayside, a modern pair of cottages or small houses, and I propose on the screen to alter these bit by bit, and see if we cannot make something more interesting and more architectural. Some persons would "beautify" the building by incorporation of details obtained from a builders' merchant, but I am sure you will not approve that way. We could metamorphose it by putting on this low-pitched roof with deep eaves, and these casement windows, but I propose we have a steeper roof and retain sash windows, re-arranging the chimney flues to give the shafts a little more bulk as seen from

the front. Then alter the arrangement of the windows to get a better disposition of solids and voids and at the same time improve the proportions of the openings. We will now introduce horizontal lines by putting caps to the chimneys, adding a simple cornice and altering the projection of four courses of bricks to produce a horizontal line. Then we must get rid of these horrid little doorways with their mean pentice hoods, replacing them by others architecturally designed. In the next slide you see the original pair of cottages and below the pair as we have altered them.

It had been my intention to talk about half-a-dozen of the building trades, but I have had to cut these down to three. What I propose to do is to show you some of the methods of the roofing trade—the tiler and slater; the bricklaying trade, in connection with chimneys and walls; and the carpenters' and joiners' trade, with examples drawn from a period of over four hundred years.



FIG. 1.—A Cotswold cottage which has the true craftsman touch.

■ We take roofs first, not last, for a good roof is a very important thing, first looking at two houses and afterwards at details. This is a little cottage in the Cotswolds (Fig. 1), built of local stone, irregular in its composition; instead of there being an angle in the valley where the gable roof meets the main roof, the valley is curved by cutting the slates so as to sweep the curve. The bellcast treatment of the eaves also is very happy.

A Sir Edwin Lutyens house at Shelford. It depends for its effect not upon trimmings but upon fundamentals—the principal mass of the house itself, the secondary masses of the wings, the tertiary masses of the chimneys, all symmetrically arranged. Again I wish to direct your attention to the bellcast of the eaves.

In the next we do a bit of dissecting; two outlines of buildings, one showing how gables and eaves were treated in an old building, the other showing how they would be treated by an ordinary modern builder. We go on then to look at this cottage in a Sussex village, where you have the use of the half-hip or jerkin head gable roof; the eaves of which protect the gable window. Here we have a thing you often see in old houses, an extension of the main roof which is carried over a ground floor extension at a slightly flatter pitch. Here in this case at Biddenden the craftsman has to cover the head of an oriel window, which he has done by sweeping his main roof up over it—quite a charming effect.

STONEFIELD SLATES WITNEY, OXON.

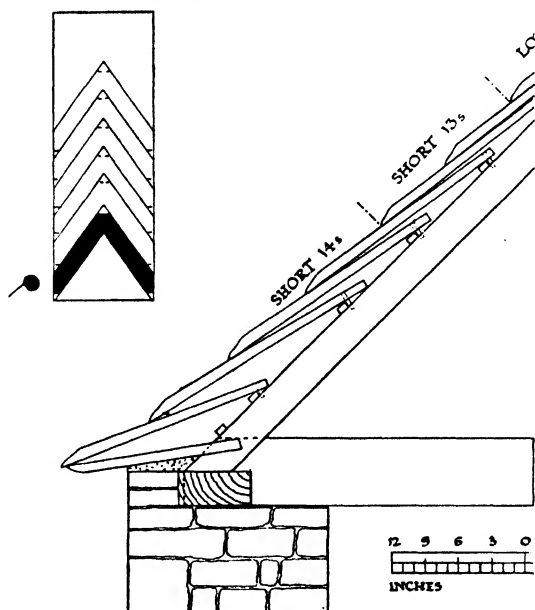


FIG. 2.—The wall-plate is set back from the outer wall face, the first courses of slates laid very flat, the heads under the battens. The second course is laid with steeper pitch and the following courses steeper still to whatever pitch has been chosen for the roof.

Ridges are sawn out of stone.

Returning to the question of bellcast, here you have an old roof, near Liddington, in which you have a very distinct bellcast. Nowadays we have recognised the

value of that upward sweep of the eaves, and we contrive to accomplish it by nailing what we call sprocket pieces on the rafters, but this section of a Cotswold roof in the Witney district shows how bellcast naturally comes from the method of bedding the first course of stone slates (called cussomes) on the top of the wall. (Fig. 2).

Then, as to valleys. Here is an enlarged detail of the Barrington roof with its swept valley and inverted ridge coping at the vulnerable junction of ridge with main roof, and a plain-tile valley, swept with tiles in the same way as that at Barrington is swept with stone. Here is an interesting thing I came across last year, a stone slate valley, in each course of which square slates are set diagonally in the valley, and to this the course is swept up from each side. Only a little bit of the square slate shows. That is a very old roof, and a very old way of treating a valley. The same thing is done with ordinary red tiles in the present day by using "tile and a half" in the valley. In the next illustration (Fig. 3) you see a progressive photograph of this. A man accustomed to such work will sweep these courses up to the square tiles without cutting a single tile— a fine bit of workmanship.

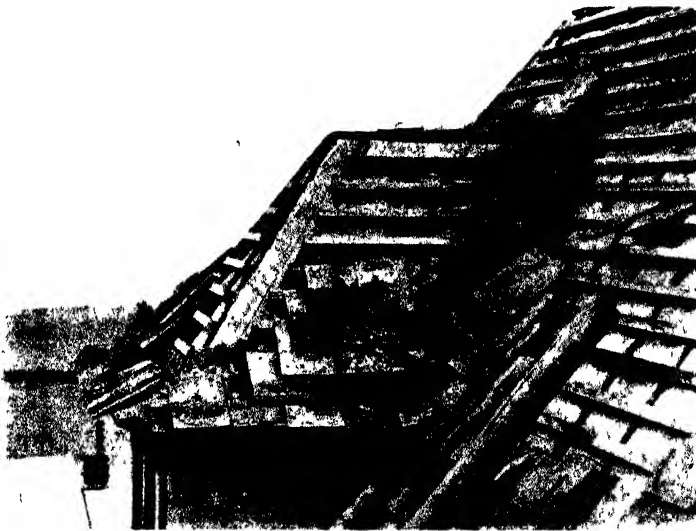


FIG. 3 — " Laced " valley. Modern way of sweeping tile courses up to square tile hung diagonally.

Just as a good roof is a very important part of a house, so the design of dormer windows and chimneys may make or mar a house. Here (Fig. 4) you have two gable dormers, both fine examples of the mason's craft. And here (Fig. 5) is a bad one ; it stands far too high, and too much lead is showing. Compare it with the next (Fig. 6), where the dormer sits right down on the roof, with a proper verge showing in a workmanlike way, with laced valley and having the hips swept up nicely, and the ridge filled in with courses of plain tiles. A craftsmanlike job.



FIG. 4.—*Left* : modern slating and angular valley.
Right : old slating and swept valley.

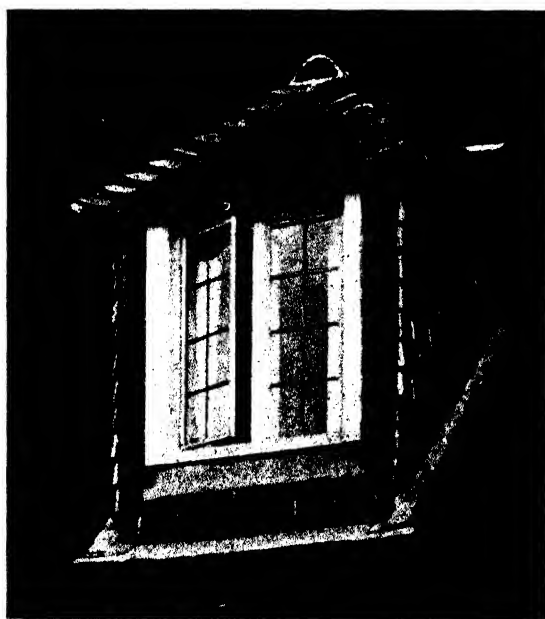


FIG. 5.—A bad dormer.

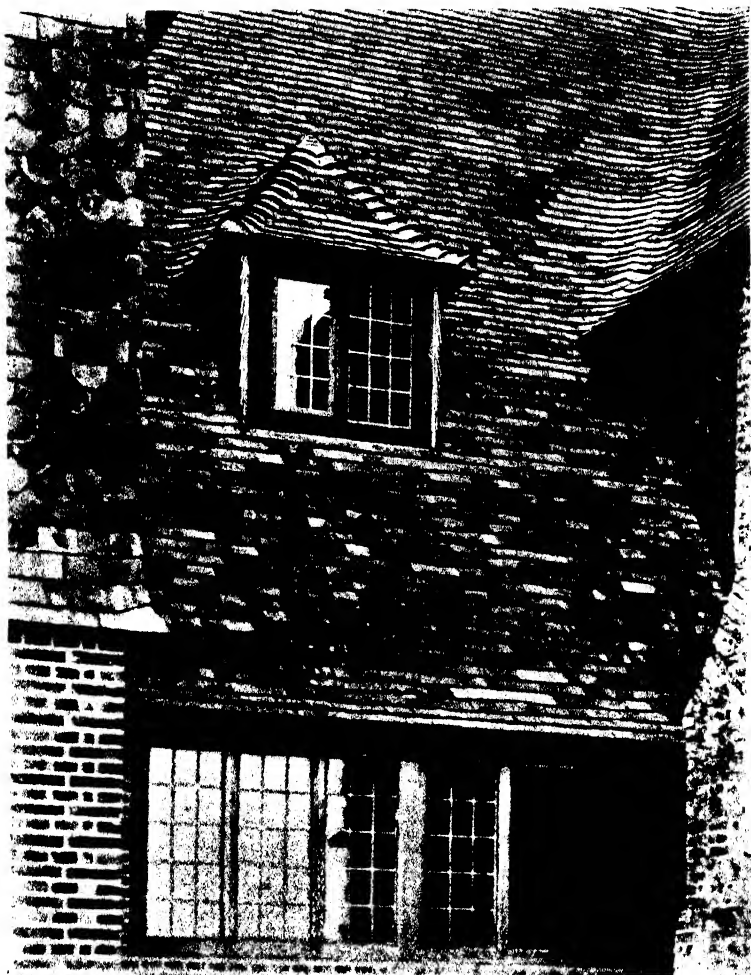


FIG. 6.—A craftsman's dormer.

We turn to the bricklayer, and begin with chimneys, which are very important. These illustrations (Fig. 7) give examples of good and bad chimney work, and here is another contrast slide, showing the virtues and vices. The chimney (Fig. 8) was not produced by a jobbing builder, but in the office of the Borough Surveyor in a large town.

With reference to walls and bonds I show you in these diagrams (Fig. 9) most of the bonds in use, including Monk bond and the Dutch bond, which might well be used more frequently for variety. Much modern building has to be done with 11-inch walls, and costs will not permit of these bonds. The monotony of stretching



FIG. 7.—Chimney Caps.

Top Left—17th century.

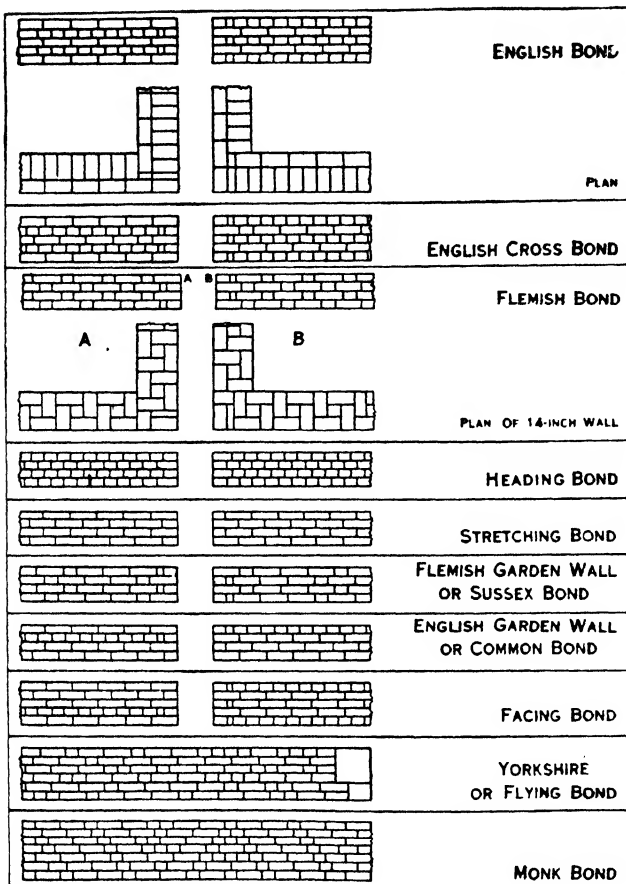
Bottom Left—modern: rounded edges to sailing courses.

Top Right—too heavy cap, too much projection.

Bottom Right—same bricks, less projection.



FIG. 8.—\ bad chimney, too thin in elevation.



FROM "A HISTORY OF ENGLISH BRICKWORK"

English Bond has alternate courses of headers and stretchers. In English Cross Bond stretchers break joint. Flemish Bond has alternate stretchers and headers. In Heading Bond, all bricks are headers except at the quoin. In Stretching Bond, all bricks are stretchers, except the alternate headers of the quoin. In Flemish Garden Wall, three stretchers, then one header in every course; in English Garden Wall, three stretching courses to each heading course. Monk Bond has two stretchers, then one header

FIG. 9.

and facing bonds may be avoided by the use of Flemish garden wall bond, which consists of three stretchers and then a header in the same course. This Flemish garden wall bond breaks up the mechanical regularity of a wall of stretchers. Another way is to use English garden wall bond, which consists of three or four courses of stretchers and then a course of headers. In America they call that Common Bond. In the States they are very enterprising in their variations of bond, and they have experimented much more with Dutch and English and other bonds than we have. Another way of getting patterns on walls is by colour. In

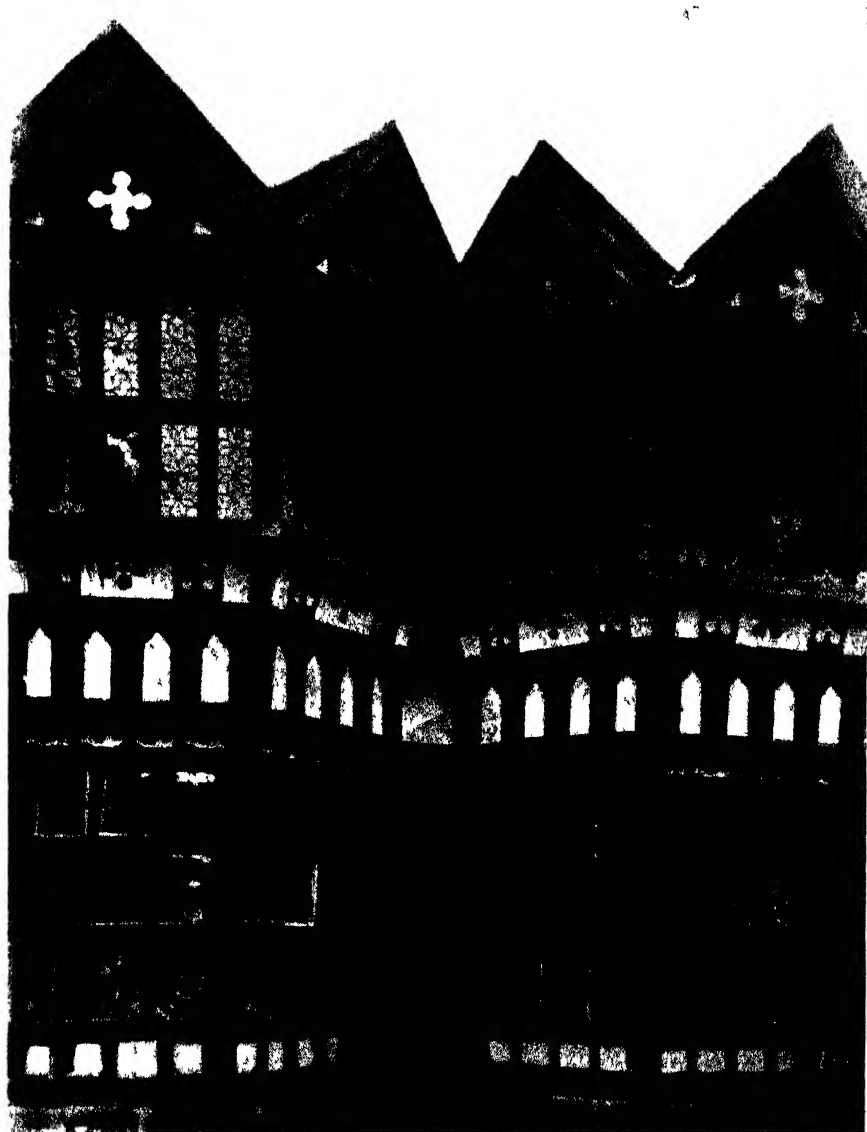


FIG. 10.—Bay windows, Little Moreton Hall, Cheshire.

burning bricks there are always a certain number the ends of which get more fire than the sides, and that turns them a grey colour. By taking these out and using them as shown in these illustrations you can produce different effects

Now I must show you one or two things done by the carpenter and joiner. Here (Fig. 10) are the bay windows of Moreton Old Hall, constructed by Richard Dale,



FIG. 11.—Moulded ceiling beams and joists showing the amplitude of material in the medieval craftsman's work.

a man who had the true craftsman spirit and who was proud of his work. "He, being dead, yet speaketh." He says : " Richard Dale, carpenter, made this window by the grace of God." I think this piece of middle sixteenth century work has hardly been excelled anywhere. Dale and his kind worked with ample material ; when they put in ceiling joists or beams they used oak, and plenty of it (Fig. 11). In due course the mediæval carpenter disappeared and was succeeded by others, and we have here an illustration of an eighteenth century town house at Tenterden, done by the carpenter of his time, covered with weather-boarding and painted. It is a warm and comfortable house, and there are no " frills " about it. The principal

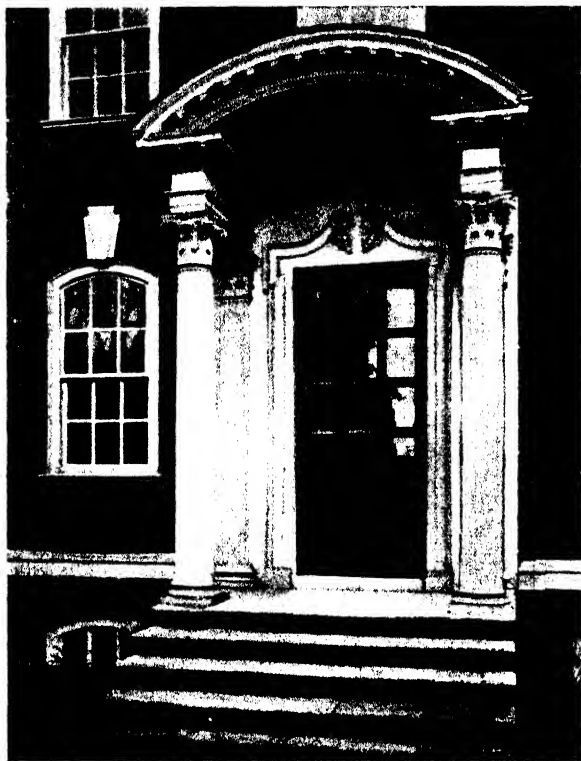


FIG. 12.—A triumph of joiner's craftsmanship. Perhaps the finest of its kind.

feature is the doorway—a regular country carpenter's doorway. These carpenters had an eye for effect as well, and here you will notice the cornices of these windows, the detail of each of which is larger as it is further from the eye.

I am now showing you some doorways from the town of Deal, which is rich in these applied to humble dwellings. The carpenters got their proportions from books, and interpreted them and blundered through them more or less happily in their own way. They took a pride in their little doorways, which are simple and excellent. I don't want you to go away thinking these men only did humble work, so, by contrast, here is a super-doorway at Rainham Hall (Fig. 12), in Essex, of date about 1727; it is the best doorway of the time that I know. In conclusion we will look at one or two minor works done by carpenters, for these men did not confine themselves to works on buildings. Here you have an old market stall in the market square of Shepton Mallet, built, with regard to the use of the thing, of oak covered with pantiles, a nice, honest piece of country carpenters' work; and last, an ingenious tumbling stile in Sussex.

That is the final item in the box of tricks I have here to-night, and I hope you will spare neither criticisms nor questions, which would enable me to make clearer anything I may have failed fully to develop.

DISCUSSION.

DR. W. RUSHTON PARKER said he had noticed in travelling about the world that in China and Japan, and elsewhere, the roofs very often were made to curl up at the ends, and this struck him as having a tasteful effect. In Turkey and other Muhammadan countries, too, there would be formed in many roofs two-thirds or three-quarters of a sphere. Would it be in bad taste to introduce such things into this country?

MR. NATHANIEL LLOYD replied that much of the effect depended on the materials used to produce these pagoda roofs. The pantiles in the countries in the East were quite different from those in this country. It was rather a dangerous thing to import foreign notions. That applied to the horseshoe arch as well as the pagoda roof. On the whole, using local material in the local way, with only a little introduced from outside, was generally most satisfactory.

MR. J. H. LEVERTON, referring to the lecturer's remark that he was unable to separate design from craftsmanship, said he would suggest that this applied only to detail. Of course, a great deal of the detail shown on the screen had been designed by the craftsman. The architect then only gave a general design, and the craftsman designed the details. That was changed now, and in the interesting examples given on the screen showing the development from a Council house into a cottage which was a work of art he thought it must all have been done in the architect's office.

MR. NATHANIEL LLOYD replied that it was difficult to say where one ended and the other began. He agreed that the combination of the designer and the craftsman was mostly in detail. Somebody must have conceived the general scheme to begin with.

MR. M. A. BUCKMASTER suggested that it should be possible in an age like the present, when we were in a tremendous hurry and very mechanical in our building, to have some standard patterns of doorways, of good proportions, even copies of some of the best examples of wooden doorways, like those shown on the screen, for use in the "ribbon" developments which were going on all over the country. These developments would probably be checked but they would not be stopped, and it would be a good thing to regulate them in some simple manner. Of course, this was foreign to all the ideas of practising architects, because it would be cutting into their preserves, but something could be achieved in a simple way. Already stock patterns were used for window sills and other things. Why should there not be stock patterns for other things in decent style?

MR. NATHANIEL LLOYD said this was an extensive field which was worth exploring. The production of buildings was divided too much among different classes, all in watertight compartments—the architect, the builder who did not work under an architect, the man who supplied stock details of his own designing, and so on. He had thought for a long time that if they were going to do anything to improve that kind of architecture which was devastating the countryside it would be necessary for architects as a class and the classes of people who erect these buildings to get together. The architect could teach the builder a very great deal in his own jobbing, speculative building trade, and the speculative builder, who knew to a shade where a shilling could be saved, could show the architect how to work up to a closer cutting of costs. Much could be done towards improvement if they all were in closer touch.

A MEMBER OF THE AUDIENCE asked if there was any scale which determined when a roof should have a particular sweep or a particular height. Or was there any area scale?

MR. NATHANIEL LLOYD replied that high pitch meant higher cost. The question as to how much was gained by increasing the pitch, and setting that against the extra cost, was a problem that must be settled in each case on its merits. There could be no scale.

MR. LEVERTON remarked that it would be a good thing if architects would concentrate more on general design, and not fritter away so much of their time on details. He thought it would be good for the architects themselves and for architecture.

A MEMBER OF THE AUDIENCE suggested that it would help the object they all had in view if the architects would leave their drawing boards more and go out on the work to supervise it more than they did, getting alongside their craftsmen and working with them.

THE CHAIRMAN expressed his agreement with the last speaker ; those who were most successful, especially in country building, were those who went out most. Much of the interest of the work of Sir Edwin Lutyens had grown up from his handling of material in his young days, and from his seeing the native ways in which various small details were tackled in the country.

A great danger came in after the renaissance with formal design of the Palladian type. Although architects began to publish their drawings, they managed to infer that their systems of proportion were mysteries. However, that formalisation of design had one very good effect, not in the large house, but in the sort of doorways the lecturer had shown on the screen. These doorways were all obviously inspired by some formal designs published in a handbook, such as the Batry Langley handbooks. It had been suggested by Mr. Buckmaster that something of the kind should be done again. But such standardised designs must fall in with the taste of the times. The Deal doorways were made when everybody was infected with a formalisation of life which was applied alike to big and little buildings. The speculative builder to-day was meeting a different type of client, folk who had not that kind of background of formal culture. If architects were to put forward standardized houses of good design in the manner that had been suggested he did not think they would be a success at once. People would have to be educated up to them. At the Royal Institute of British Architects they had actually got schemes for panels of architects, like panel doctors, who would design at a cheaper rate for a number of houses. It had to be remembered, however, that this small work was being done to-day for a class of the public which differed from those who ordered such structures in past times.

A vote of thanks to the lecturer having been passed unanimously the meeting terminated.

OBITUARY.

G. BIRD GODSON.—Mr. G. Bird Godson, a Fellow of the Society, died suddenly at Bulawayo, South Rhodesia, on April 12th, during the course of an African tour. Mr. Godson was a Past President of the Institute of Builders, London, and of the London Master Builders' Association, and before his retirement a few years ago was a partner in the firm of Messrs. G. Godson and Sons, building contractors. He was responsible for the erection of a number of important London buildings, including the South-Eastern Hospital, the Royal Society of Medicine, the offices of the Royal Zoological Society, and Holy Trinity Church, Kingsway.

EXHIBITION OF PRINTED BOOKS

EXHIBITION OF PRINTED BOOKS. Imperial Institute, London, S.W. Also Exhibition of Paintings, Engravings and Sculpture by Artists Resident in Great Britain and the Dominions. Till June 28th.

The Exhibition of Printed Books, opened on May 12th by the Lord Mayor, has been organised by the Linotype Company. Nearly all the books shown are modern, but there are also one or two interesting historical exhibits, such as a portion of the 42-line Gutenberg Bible, and an example of work by Caxton.

The variety of modern faces used is remarkable, and yet one seems to find little straining for irrelevant effects; the ideal of legibility has everywhere been faithfully pursued. In one case we see the original *de luxe* edition of the late Poet Laureate's "Testament of Beauty" (36), and beside it an exact reproduction in ten-point instead of fourteen-point size (37), this having been done by the Aquatone process. Further on we see books in foreign languages, and each one reads crisply and suits the typographical idiom of the country concerned.

Going upstairs now to the Imperial Gallery of Art, our emotions are unsettled by another sort of variety. For here we have good, bad, and indifferent. For good I should have said very good. For instance 133, C. R. W. Nevinson's "St. Paul's from the South," Duncan Grant's 177, "Still Life," and three little pictures by that talented young painter, Rex Whistler: 172, 180, 186. Curiously effective too is Gilbert Spencer's "Group of Trees," 157.

Whistler is, of course, already well known for his Millbank decorations. Lately he has done an excellent, humorous book jacket for Miss Sitwell's life of Pope. He is humorous, and sophisticated, but these three little pictures show that he is much more than an accomplished connoisseur. That he has really a manner of his own his posters would have proved by themselves. Here we see that he has vision; that he knows what it is worth setting out to paint, and how to communicate his vision to others.

Among the sculptures we do not find Mr. Dobson's head of a girl standing out as we might expect, nor is Maurice Lambert seen at his best. The small Indian ivories are charming, but perhaps nothing more.

The general level of the exhibition is a high one, the peaks being much more striking than the occasional depressions. The more one sees of the work of our contemporary artists and craftsmen, the more one feels that British Industry has, in respect of design, at least, some splendid opportunities to-day. For instance, many of the painters represented here have already shown conclusively that they can apply their talents to the beautification of practically everything in domestic use. The opportunities of Industry should be theirs also.

P.B.

NOTES ON BOOKS

MODERN ARCHITECTURE. By Bruno Taut. London: The Studio. 30s.

In these days, when it is positively respectable to write books, provided one is anything but a mere man of letters, it is delightful to find people dealing enthusiastically with their own subjects. In spite of the demand for books and articles on the Home by Channel swimmers, on Interior Decoration by tennis stars, on Low Life by snobs, architects persist in writing about architecture. They mainly

write very vividly, sometimes, as in the cases of M. Corbusier and Herr Taut, as if their passions were aflame.

But the arts and sciences are entangled, and we must expect to be involved by our architect-authors in arguments of a philosophico-sociological character. Herr Taut loses no time in announcing the intricacy of his thesis; the only trouble is that his ultimatum is so worded as to suggest that the battle of ideas has been fought and won, and that all that remains is to lay down the conditions of future harmony. But the battle has not been won.

Let us put aside the question of the identity of beauty with efficiency, in which so many people are determined to believe. They have Moses and the Prophets, and will not hear; they are not likely to attend to what a few mild *minor* prophets have to say. A much more practical, though of course not more interesting or important question is at issue. Are we ready to abandon the architecture of Individualism for the architecture of Communism?

It is taken for granted by Herr Taut that the world is undergoing a particular change: moving inevitably in a particular direction. Really, a number of communities with different characters are moving, some forwards, some perhaps backwards, in their private directions and each in its own *tempo*. Still more *really* in every community there are so many individuals, each dreeing his own weird. Why should a motor owner think crinolines absurd? Does Herr Taut want him to dress up as a motorist, with goggles and gaiters? "All or nothing" is an unreasonable principle. Art consists in picking and choosing.

Modern circumstances of industry and population have obviously demanded an appropriately convenient architecture. But industry and population have not simply got to be indulged; they will have to be controlled if the sum of human happiness is not to grow less and less, and, if society and art are not to become inhuman, the standards to which they must always be referred are no doubt those laid down in the first place by Greek thinkers. To reject Gothic inspiration in modern architecture is reasonable, but Classic forms and principles are too much bound up with the unchanging conditions and desires of humanity to be treated as negligible at any time.

We certainly do not want skyscrapers to put up Doric façades; but then it may be suggested that an architectural idea which cannot be expressed in the language of humanism may be a bad idea; an idea which may be in keeping with subhumanity or superhumanity, but not with humanity.

At the same time it would be wrong to regard every building which looks rather new and strange as an example of "modern" architecture. New words are constantly being added to the vocabulary of the language of classical architecture, new words and new idioms too. Turn to pages 50 and 51 in Herr Taut's book; you will see what must appear to be links between the old and *some* of the new, suggesting that part of the modern European architecture is directly descended from Renaissance types. Herr Taut does more justice to the talent of Adolf Loos than to the principles illustrated by the work of this admirable Viennese pioneer.

But the whole chapter on architecture before the war is most interesting. Note Fischer's garrison church at Ulm, precursor of perhaps better known churches in the vicinity of Paris built since 1918. Note the elegance of the *Bon Marché* interior, page 46, and then turn to Schinkel's design for a departmental store, made more than a hundred years ago (page 35).

While we must admire Herr Taut's fluency in a language not his own, we may find that he does not express himself with equal clarity throughout the book. In the concluding chapter, with its comments on England, it is not always easy to follow

his trend of ideas. England has been shy of experiments, but though this timidity does not spring from the more amiable aspects of the national character, the actual result has not been bad. Our evolution may be reluctant, at least it is always comprehensible and polite. A visit to Brighton, with its wonderful marine squares and terraces of the Regency period, will show that the principles of efficient building were grasped by our ancestors, who also understood the value of regular straight lines and curves.

Everywhere towns are being built and rebuilt. Let original genius be welcomed—when it is recognised—but let no-one imagine that any new communal solidarity can falsify the criteria of the Greek and Renaissance architects. It is the individual, not the crowd, who is the measure of all things.

GENERAL NOTE

LEAGUE OF NATIONS : INTERNATIONAL INSTITUTE OF INTELLECTUAL CO-OPERATION.—INTERNATIONAL EXHIBITION OF CASTS.—The second international exhibition of casts, organised by the International Museum Office (International Institute of Intellectual Co-operation), will be inaugurated on May 31st, at the Cinquantenaire Museum at Brussels. This exhibition will contain 400 specimens of various sizes, sent by the museums and casting workshops of Athens, Berlin, Brussels, Florence, London and Paris. The casts on exhibition reproduce master-pieces of Assyria, Egypt, classical antiquity, the Middle Ages, the Renaissance and modern times up to the beginning of the 19th century. This exhibition has already been shown with great success at Cologne. It should be noted that the object of the International Museum Office in organising this exhibition was to provide a miniature sculpture museum, by means of casts. The pieces have been carefully selected for this object and the exhibition may serve a very useful purpose in showing educational bodies, in towns which have no original collections of works of art, what may be done in this field. They would thus be enabled to form collections of casts which are necessary for the education and formation of public taste. The bronze cast of a statue of Zeus, a masterpiece from the Athens Museum, discovered scarcely two years ago at the bottom of the sea near Euboea, will be exhibited for the first time at the Brussels Exhibition.

MEETINGS OF OTHER SOCIETIES DURING THE ENSUING WEEK.

MONDAY, JUNE 2. Geographical Society, at Æolian Hall, New Bond Street, W. 8.30 p.m. Mr. Bertram Thomas, "A Journey to the Centre of the Rub al Khali."

Royal Institution, 21 Albemarle Street, W. 5 p.m. General Meeting.

University of London, at the London School of Economics, Houghton Street, W.C. 6 p.m. Prof. C. Burt, "The Measurement of Mental Capacities." (Lecture II.)

TUESDAY, JUNE 3. Illuminating Engineering Society, at the Home Office Industrial Museum, Horseferry Road, S.E. 6.30 p.m. Annual Meeting and Presidential Address.

Research Defence Society, at 11 Chandos Street, Cavendish Square, W. 3.15 p.m. Annual General Meeting. Mrs. E. Mellanby, "Diet and Dental Disease." (Stephen Paget Memorial Lecture.)

University of London, at University College, Gower Street, W.C. 5 p.m. Dr. Lythgoe, "Special Sense Physiology." (Lecture VI.)

WEDNESDAY, JUNE 4. Faraday Society, at King's College (University of London), Strand, W.C. 5.30 p.m. Prof. T. H. Laby, "Quantitative and Qualitative

Analysis by X-Rays." Mr. J. T. Calvert, "The Determination of Potassium in Soil Samples by the Application of an X-Ray Method."

University of London, at King's College, Strand, W.C. 5.30 p.m. The Right Rev. Bishop Gore, "The Idea of the Church and the Sacraments. Lecture II—Episcopacy in Theory and History."

At the School of Oriental Studies, Finsbury Circus, E.C. 5.30 p.m. Mr. W. P. Yettis, "Chinese Bronzes. Lecture III—Decorative and Symbolic Motives in the Design of Bronzes."

THURSDAY, JUNE 5. Chemical Society, Burlington House, W. 8 p.m. (1) Mr. A. W. Chapman, "The Influence of a soluble Fluoride on the Corrosion of Iron." (2) Mr. G. B. Harrison, "The Application of a new Type of Triode Valve to the Determination of Hydrogen Ion Concentration with Glass Electrodes." (3) Messrs. E. H. Farmer and T. N. Mehta, "Properties of Conjugated Compounds. Part X—Variability in the Mode of Ester-addition to Butadiene Esters and Ketones."

FRIDAY, JUNE 6. University of London, at King's College, Strand, W.C. 5.30 p.m. Prof. D. Saurat, "Les Principales Caractéristiques de l'Esprit Moderne dans la Littérature Française : Gide, Proust, Valéry, etc."

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No. 4046

FRIDAY, JUNE 6th, 1930

VOL. LXXVIII

All Communications for the Society should be addressed to the Secretary, John Street, Adelphi, W.C.2.

NEWS OF THE WEEK

Art Galleries.—**LEICESTER GALLERY.** VAN GOGH AND SCULPTURE BY FRANK DOBSON.—One can use the word “modern” without fear as applied to Van Gogh. Whatever has been said and done under this banner he has vindicated it forever; he interprets the modern spirit with all the fire and intensity of the old masters: he is always experimenting, never content until he has explored every avenue of expression and every angle and character of the subject. In this exhibition there are some remarkable views, one especially of rushing clouds across an intensely blue sky and another of a field with irises, painted with tremendous vigour and beauty.

Frank Dobson shows his much discussed statue of “Truth.” One is curiously disappointed at first in a rather heavy young woman carelessly seated, and yet it dominates the room and the more the beholder tries to escape the more it holds and focuses attention. It is really quite uncanny in its power and it is interesting to see how cleverly and quietly the artist has built up the apparently careless effect.

MANSARD GALLERY. WEDGWOOD BI-CENTENARY.—There is much food for thought in this marvellous display of Wedgwood pottery old and new. It is distinctly disconcerting to think that complete perfection of design and texture was attained almost two hundred years ago, and that there is nothing left for us except the improvement of mass production. It is a wonderful tradition and it is interesting to compare the different designs and to see some of the first examples of the work of Josiah Wedgwood himself. Last but by no means least of the attractions is a potter’s wheel from the Etruria works at Burslem, on which a skilled potter moulds jars miraculously before your eyes, and even tea pots! Messrs. Heal must be congratulated on having secured this exhibition and also on a very beautiful and well-lighted Gallery as a background for the exhibits.

ARCHITECTURAL ASSOCIATION GALLERIES. ERIK MENDELSON.—This exhibition of the work of the famous German designer is especially topical just at the moment

when there is so much discussion going on about traditional and concrete building. It shows a magnificent handling of concrete and ultra modern architecture quite unhampered by rules and conventions. This type of building most emphatically needs its setting; it cannot be set against ordinary traditional building, but in a new street or boulevard such as they are building in Germany it would be magnificent. It expresses the new spirit in factories, shops and business premises, but it has no connection with the old: it is revolutionary and complete in itself. In England we cannot thrust aside tradition so completely as they can abroad, we move more slowly and therefore we often make the mistake of half heartedly mixing the old and new, putting half timbering next to concrete—both are fire in their way—but not in the same street!

Anyone genuinely interested in the future of our cities should visit this exhibition.

THE SPANISH CLUB GALLERY.—VICENTE ROMERO.—An interesting exhibition of Spanish flower paintings was opened on May 28th at the Spanish Club Gallery, 5 Cavendish Square, by the Spanish Ambassador, who spoke of the wonderful gardens of Valencia, "famous all over Spain," which are the inspiration of Señor Romero's pictures. These strike quite a different note to the suavely painted pictures of carefully arranged flowers to which we are accustomed, and plunge us immediately into the riotous South—into a world of roses, carnations, and purple convolvulus overflowing from wheel-barrows, garden baskets and Mauresque urns. Señor Romero has an effective way of setting off the deep pinks and scarlets of roses and carnations with subtle shades of blue and mauve, supplied by the pattern of a plate or dish, or, as in one picture, by an enveloping bower of convolvulus blooms. The Southern note is emphasised in several of the pictures by the introduction of a Spanish shawl or a black sombrero. One feels that these pictures could not have been painted anywhere else than in Spain. Their flaunting colour seems to intensify for a moment the London sunshine and to transport one into a Spanish garden with a suggestion of cool corners, as in No. 7, in which a bronze urn filled with scarlet and yellow roses is placed on the parapet of an old well overhung by the branch of a lemon tree. Another striking arrangement is No. 37, in which a vase of flowers is set against a background of hot blue sea.

This exhibition, which also includes some attractive fans painted in the same manner on kid or silk, is well worth a visit. It remains open until June 18th.

Books.—**THE EDWARDIANS.** By V. SACKVILLE WEST.—Miss Sackville West is one of those rare people to whom one looks for something out of the ordinary; she possesses a surer touch and a more definite stamp of personality than almost any other woman writer living. Here is a story in a most unusual setting, about the year 1905. Up till lately there has been a fashion for writing about the Victorian era and up to the beginning of this century, and then there is a gap until the war, but enough years have now elapsed for the spacious Edwardian days to have become a definite period, and it is distinctly entertaining to see them portrayed from this point of view. The description of Lucy dressing

for dinner is a perfect picture and though the story itself sometimes loses interest the setting and atmosphere are so surely and charmingly depicted, that we do not seem to notice an occasional lapse of cohesion in the plot. The writer has the great gift of making us hear the rustle of innumerable frills, and see the spreading lawns, the bows and curls and conventional intrigues of those far-off days before the war. An altogether delightful and interesting book.

Theatres.—THE NEW THEATRE. "THE LAST CHAPTER."—Here is a good commercial play, and this is casting no slur, for in the end a really good commercial play is the test of the work of the theatre; even Shakespeare was a "best seller" in his time, dramatically speaking. This is in no sense a great play, but it has characterisation and an excellent murder mystery, which is a genuine mystery till the last ten minutes of the play. We particularly notice this production because it is the first venture of a new management "The Famous Players Guild" who are not out to better the drama, but solely to amuse and entertain, which is no mean ambition. The only stumbling block to their complete success in this play is the hero, played by Mr. Owen Nares. He has to impersonate a writer of sex-appeal novels, possessing a considerably lurid past to match, but, excellent actor as he is, he cannot possibly make one believe that he is anything but a most charming man living an utterly blameless life. This very nearly wrecks the play which turns on the story of his callous treatment of various ladies; however, it makes excellent entertainment and is well played and produced apart from this piece of miscasting. We wish the Guild luck in its venture.

St. John's College, Battersea.—An Appeal is being issued for the "Preservation of one of the few objects of Beauty and interest left in Battersea." The particular and reputed Wren House already illustrated in the *Journal* is described in the volume dealing with the West End of London by the Royal Commission on Historical Monuments as "Terrace House," and it is very accurately and well-described as follows:—

"*Terrace House*, now part of college buildings, about 275 yards S. of parish church, is of two storeys with basement and attics; the walls are of brick and the roofs are covered with slates. The house was built c. 1699, the date on a sundial, and has been little altered. It is a good example of its period. The Elevations have a moulded brick band between the storeys, an eaves-cornice of wood and hipped roofs with gabled dormers. The dressings generally are of red brick. The front has a central doorway with an elliptical arch with moulded impost; it is flanked by Doric pilasters on which rest scrolled and carved brackets supporting a pedimented hood; below the hood is a frieze carved with geometrical instruments, a globe, etc. The window above the doorway has a rubbed-brick architrave. The N.W. side has, at the first-floor level, a rectangular stone sundial with the motto and date "Pereunt et imputantur, 1699." The S.W. has projecting side wings; in the middle of the main block is a doorway with a square head, Doric side pilasters and a flat hood with carved and scrolled brackets; the frieze under the hood is carved with a dolphin and conventional foliage. The S.E. side is largely covered by modern buildings. Interior.—Most of the rooms on both the ground and first floor retain their original panelling and cornices. Some of the rooms on the ground-

floor have original marble architraves to the fireplace openings. The doorway between the central hall and the main room to the N.E. of it has a round panelled arch and is flanked by fluted Corinthian pilasters on panelled pedestals; the spandrels are carved with scrolled ornament. The original staircase has turned and twisted balusters, close strings, panelled newels and a moulded handrail, ramped over the newels; across the top of the stairs, at the first-floor level, is a gate. Condition.—Good."

No reference is made to its being by Wren, but anyone familiar with his details cannot help identifying this fine house with him in the same way as we speak of an Adam house. Neither of these great artists in building material could possibly have personally controlled all the work they are reputed to have supervised.

It is rather strange that no illustration is given of a house more important in character than many illustrated in Holborn, Fulham or Hampstead. This and Devonshire House and its very fine gates are treasures which Battersea cannot possibly lose without shame. Why must the general public be asked to subscribe to a Preservation Fund? The district may be poor, but it would be poorer still if it lost these vestiges of its educated past. We appeal to the Mayor, the Rev. A. E. Prichard and his Aldermen to take advice if they really contemplate proceeding to destroy anything so vital to the Art of noble building. Anyhow, before they seriously decide to proceed, will they say how many tenements they propose of necessity to place on the site? It is inconceivable that the space of this house on so large a site could materially reduce the number required. There surely must be some open space and the block could be set back and connected up to this house as an architectural terminal of real beauty. The style of the house and its formal manner should give the motif for the block of tenements. We understand that no plans are yet drawn for the proposed new buildings so that there is time for Battersea to deal with the problem of keeping a fine building and incorporating it into its housing proposal with an educated foresight that will be an example to other districts. It is a noble site, apart from the house which adorns it.

The two Members of Parliament, Mr. W. E. Sanders and Mr. William Bennett will, we hope, see that the ratepayers are not robbed of an asset to their district. Mr. John Burns heads the list of sympathisers. We are sure he can do much to influence his old constituency to retain so interesting a feature of the Thames-side.

PROCEEDINGS OF THE SOCIETY

TWENTY-THIRD ORDINARY MEETING

WEDNESDAY, MAY 28TH, 1930

MR. FRANK H. WEDGWOOD in the Chair

THE CHAIRMAN said the title of the lecture—"Josiah Wedgwood, Potter, Inventor and Man of Science"—covered the ground very well, except in two lesser points. In addition to being a potter, an inventor and a man of science, Josiah Wedgwood had his philanthropic side. He had been well ahead of his age in his desire to have his working people properly housed, and he had built a model village for them.

Royal Society for the Encouragement of Arts, Manufactures and Commerce.

JOHN STREET, ADELPHI, LONDON, W.C.2.

Founded in 1754.

Incorporated by Royal Charter in 1847.

PATRON: HIS MAJESTY THE KING.
VICE-PATRON: H.R.H. THE PRINCE OF WALES, K.G.

FORM OF APPLICATION FOR FELLOWSHIP.

I desire to have my name recorded as a candidate for Fellowship.

Name _____

Address _____

Rank, }
Profession or }
Business. } _____

Name of Fellow to whom reference can be made _____

In the event of a candidate
not being acquainted with
any Fellow, he may submit
the names of three suitable
references. }

Proceedings of the Society.

THE SOCIETY was founded in 1754, and incorporated by Royal Charter in 1847, for "The Encouragement of the Arts, Manufactures and Commerce." In 1908 the Society was granted the privilege of adding "Royal" to its title.

FELLOWSHIP.—At the Annual General Meeting held on June 24, 1914, a By-law was made authorizing all Members of the Society to use the designation of Fellow. The official abbreviation is F.R.S.A.

ORDINARY MEETINGS.—Meetings are held every Wednesday during the Session, at which papers on subjects relating to inventions, improvements, discoveries, and other matters connected with Arts, Manufactures, and Commerce are read and discussed. Courses of Lectures are delivered on other evenings.

INDIAN SECTION.—This Section was established in 1869, for the discussion of subjects connected with our Indian Empire. Six or more Meetings are held during the Session.

DOMINIONS AND COLONIES SECTION.—This Section was formed in 1874 under the title of the African Section. It has been enlarged to include the consideration of subjects connected with the Dominions and Colonies. Four or more Meetings are held during the Session.

ADMISSION TO MEETINGS.—Fellows have the right of attending the Meetings and Lectures. They require no tickets, but are admitted on signing their names. Every Fellow can admit two friends to the Ordinary and Sectional Meetings, and to the Cantor and other Lectures. Books of tickets for the purpose are supplied, but admission can also be obtained on the personal introduction of a Fellow. For the Juvenile Lectures special tickets are issued.

JOURNAL OF THE ROYAL SOCIETY OF ARTS.—The Journal, which is sent free to Fellows, is published weekly, and contains full Reports of all the Society's Proceedings, as well as a variety of information connected with Arts, Manufactures, and Commerce.

LIBRARY AND READING ROOM.—The Library and Reading Room are open to Fellows, who are also entitled to borrow books.

ELECTION OF FELLOWS.—Candidates are proposed by Three Fellows, one of whom, at least, must sign on personal knowledge; or are nominated by the Council.

The Annual Subscription is Three Guineas, payable in advance, and dates from the quarter-day preceding election; or a Life Subscription of Thirty Guineas may be paid. There is no Entrance Fee.

Then he had been very keen on the question of slavery, and had had an enormous number of outside activities besides his regular pottery work. He had struck a special medal on which was represented on a white ground a black figure kneeling down in chains, saying, "Am not I a man and a brother?" That medal had given an immense impetus to the whole anti-slavery movement.

Turning to the family side of Wedgwood's life, Josiah Wedgwood, his son and grandson had a certain humility which was very delightful, but which was unfortunate for their descendants, because they had not realised what a big man Josiah was, and so all sorts of possessions of the old gentleman had been scattered away through the family. The more he (the Chairman) thought of it, the more he wished that those possessions were all at Etruria. Josiah's descendants had made a museum in 1908, and had secured everything they could to put in it, but if only it had been put into being in 1808 instead of 1908, what a collection it would have been! That had not been done, however, simply because the old gentleman himself, his son and his grandson had not realised what were the possessions that their descendants could have had if they had understood the importance of those possessions to industry generally.

Referring to the lecturer, Mr. Barnard had gone to the firm of Wedgwood's thirty years ago, and had remained there ever since. At Etruria at present there were two real authorities on the subject. One was the Curator of the Museum, Mr. Cook. An Italian prince—a great Italian industrialist—had visited the Museum last week, and had wanted to know all about borax. At once Mr. Cook had got hold of the old memorandum book of Josiah, page 33, which set forth the fact that borax was obtained in 1771, and that it had been brought on mules' backs all the way from Tibet. Then there was another reference on page 129 to a fresh development of the borax trade. The Prince had been immensely impressed at Mr. Cook's perfect documentary arrangements at the Museum.

The other authority was Mr. Barnard. He had written a book on the subject entitled "Chats on China," and within the last three or four years he had delivered a very large series of lectures on the subject of Josiah, both in this country and America.

The following lecture was then delivered :—

JOSIAH WEDGWOOD, F.R.S., 1730-1795, POTTER, INVENTOR, AND MAN OF SCIENCE

By HARRY BARNARD

So much has been written about Josiah Wedgwood that what is said now must savour of repetition; yet his was a life so full of strenuous and persistent endeavour to serve his day and generation, and his contribution to Industry and Commerce so great, that a fresh voice and a survey of special items may add to the mass of information which is at this time finding such publicity.

To realise Wedgwood's place as "Master Potter," the "Father of English Pottery," as he has been justly called, it is necessary to glance at the state of the Pottery industry at the time of his birth.

Potting was then a home industry, carried on at the back of the modest thatched house, with one oven that served more than one potter. The ware made was

mainly of a very coarse description, the material being the ordinary marl of the district, and such articles as *butter pots*, for the farmers to carry their butter to the markets for sale ; *Tygs*, many-handled mugs for passing from mouth to mouth in the home as well as in the public house ; *Porringers*, in the centre of the table, to receive the contents of the stew pot, when each person took the fancied portion with the fingers. Individual plates, knives and forks and spoons were unknown in even such middle-class families as those of the farmers, potters, artisans and clerks.

It was this state of things which must have set young Wedgwood thinking, and the serious outlook upon his every-day surroundings fostered in him the desire to improve that which must have been distasteful to a nature like his, so that his fertile brain was alert to every opportunity that presented itself to reform both the condition of the worker and the work.

Wedgwood had no special advantages ; he was the thirteenth and last in the family. His father, a good and kindly man, was yet without energy, and records prove that he was unsuccessful, unable even at the time of his death to free himself from debts incurred in his business.

Young Josiah had the advantage of the training in character given by an excellent mother, who taught him the value of sobriety and industry at a time when the very reverse was his daily environment. He was led to see that all hope of advancement depended upon the daily exercise of self-restraint, integrity, and the cultivation of those gifts which nature had bestowed upon him. His manhood afterwards betrayed this early superior influence.

At six years of age he walked six miles each day over the hill and fields to Newcastle-under-Lyme from Burslem and back, as there was no school in his native town, so called, though it was a mere straggling village. His schooling lasted only three years, but his master reported well of him. At nine years of age his father died, and his eldest brother Thomas said : " Jos must leave school and begin to earn his living on the potbank." He started on the " potter's wheel " as a " thrower," as he afterwards said in one of his letters, " at the bottom rung of the ladder." Here he quickly mastered the " craft " of " throwing," and soon became a very smart little workman, with a desire to improve not only the " pots," but the conditions under which the potters then worked. At fourteen years of age he was apprenticed for five years to his brother Thomas, to " learn his Art Mistry, Occupation, or Employment of Thrower and Handleing."

The young apprentice applied himself to the improvement of the ordinary ware being made, both as to shape, size and capacity, matters which had received scant attention, and great results were noticed in orders received and increased output, chiefly for exportation. But his position on the wheel did not last long, a former illness having left him with a knee affection. Compulsory rest and doctor's remedies were without avail, for at about 16 years of age he had to leave the bench altogether. This was a crisis in his career, a turning point, and the necessity to leave the thrower's wheel and turn his attention to other branches of the manufacture led

to the most important consequences. He was free to pursue discoveries and improve minor points of detail. He made the remainder of his apprenticeship a period of steady attention to duties before him, and of determinate self culture.

At this time he experimented with all the materials known to him, and persistently enquired for, and found, anything that promised success, so that he was able to produce new mixtures and clays, and succeeded in making excellent imitations of such natural bodies as porphyry, agate, marble and tortoiseshell. These he made into knife hafts, snuff boxes, and other small articles for the hardwaremen of Birmingham and Sheffield.

Towards the close of his apprenticeship he turned his attention to the ordinary cream-coloured ware. For half a century the potters of Staffordshire had been making experiments, with the result that a whiter ware than could be produced with the local marls was being made, by Twyford and Astbury, as well as other potters, who had introduced this into their manufactures.

A fair trade was done in this cream-coloured ware at the old "Churchyard Works" in Burslem, where his father was "master" and his elder brother Thomas had taken charge at his death, but young Josiah at the close of his apprenticeship was not satisfied and strove to make further improvements, but Thomas, a kindly hearted man enough, was unambitious, and disinclined to leave the beaten track his ancestors had so long pursued, trying to persuade his younger brother to discontinue his experiments, which were expensive both in time and money, and suggested to him that he should not jeopardise his future success by indulging his imagination in wild schemes. However, Josiah was undaunted and proposed that he should become his brother's partner, and push the trade, introducing necessary reforms. Thomas would not consent.

Being free, Josiah accepted an offer from a John Harrison, who had invested money in a small pot works at Stoke belonging to a Thomas Alders, and took upon himself the management of this works, in 1751, at a very low salary. Here it was soon seen that a master hand had come amongst them; the common wares began to show improvement in body, form and glaze, sales increased and ready customers were found in Liverpool and Manchester. Harrison and Alders became excited and urged young Wedgwood to further exertions, but forgot to increase his share in the profits. As other conditions were not congenial to a character like Josiah's, this partnership was brought to an abrupt conclusion.

A new partnership followed closely, however. This time to a most worthy man, Thomas Whieldon, of Fenton Low, a potter who had built up a good business, whose product was above the average, showing taste beyond the ordinary level. He had a liberal mind, and in several characteristics was not unlike his young partner. The love of perfection in all work, integrity in business, genial temper and benevolence, were the attributes of both men.

Wedgwood's fame at this time must have been considerable, for one of the agreements upon entering into partnership was to the effect that he should practice for their benefit such secret processes as genius and experimental industry had

made his without any necessity of revealing to others what they were. During his incessant and enthusiastic labours he met with an accident which affected the limb already weakened by his former illness. For months he did not leave his room, but he realised that this was a golden opportunity, and his love of reading developed into a persistent method of self culture ; he improved himself in his native tongue, in arithmetic, in the history of his own country, made himself acquainted with its commercial and political relations to other countries. He bought and borrowed books, some of which on chemistry he copied with his own hand.

As soon as Wedgwood had gained a little strength he returned to his work at Fenton Low, and continued until the close of 1758 or early 1759. The partnership had then reached its limit, and was not renewed. At this period he entered into business as a manufacturer. He occupied the small Ivy House Works in Burslem at a rental of £10 per annum, and started humbly and modestly with a small capital upon his great career. His first productions were small ornamental goods.

When he started, he made most of his models, prepared his own mixtures, superintended the firing of his ovens, was his own clerk and warehouseman. Ofttimes a great part of the night was spent in making chemical experiments, contriving tools and instruments for novel effects and processes, in sketching ornaments and patterns, thus preparing himself for the succeeding day.

We must remember that when Wedgwood started as a " master " potter, he inherited a wonderful legacy in that which the labours of a race of potters had achieved. There were four generations of his own family who had been manufacturing in Burslem, and experiencing success by steady experiment, so that many of his fellow potters were making exactly the same type of ware that he started upon. It would be extremely interesting if we could at this time identify his first productions at the Ivy House Works from other specimens in our collections to-day, but the absence of marks prevents any degree of certainty. Such pieces as can be regarded as authentic show what an amount of skill and taste he had acquired by the time he decided to start manufacturing on his own account, much of which he had been able to learn, practice, and improve upon during his association with Whieldon, for it was there that he invented and proved the green and yellow glazes which appear upon his first productions, a few beautiful examples of which are in the Hulme Bequest in the Wedgwood Institute at Burslem.

By 1761 Wedgwood had brought his cream ware to a considerable degree of perfection. He had approached the matter systematically, making a vast range of experiments extending over many years, for the improvement of both the " body " and the glaze. These trials are numbered by thousands and can be seen in the museum in the works at Etruria. When he had perfected this cream-coloured ware, he tackled the problem of supplying it in a form that should meet the requirements of the table, making plates and dishes of different sizes and the covered pieces, such as vegetable dishes, soup and sauce tureens with stands ; thus he was the pioneer who introduced the dinner service as we know it. His new ware had a considerable degree of perfection. The " body " had a lightness

hitherto unknown, the glaze an exquisite brilliancy, and the forms were entirely new. Of all Wedgwood's contributions to the ceramic industry this is undoubtedly the greatest and by itself it is sufficient to place him on the pedestal of fame that he occupied, and still retains, after a century and a half has elapsed.

Before his time the "well-to-do" furnished their tables with pewter, and the more wealthy with silver plate, but the middle class, the farmer, potter, artisan, and shop-keeper, could not afford this luxury. It was by the introduction of this beautifully-made, easily-cleaned, cream coloured pottery that Wedgwood created and captured a trade that did not exist before, and which supplied the needs of the middle class buyer and furnished the homes of all countries with a hygienic domestic article which continues to be the principal output of the Staffordshire potteries in precisely the same material and composition that was his invention. Sadler & Green, of Liverpool, had invented a process of printing upon pottery. Wedgwood was attracted by it and much of his cream ware was sent to Liverpool to be printed by them.

It was during one of his journeys to Liverpool on horseback that he met with an accident to his already affected knee, which laid him up at an inn. The eminent surgeon, Matthew Turner, attended him, introducing to him Thomas Bentley, who afterwards became his dearest friend and partner. This was a memorable friendship both for themselves, their country, and the Arts they loved.

Business steadily increased and soon demanded larger premises. The works were transferred from the Ivy House Works to the Brick House Works at Burslem, called also the Bell Works, because Wedgwood was the first to use a bell to call his potters to work.

He prepared the house attached to receive his bride. He married Sarah Wedgwood, his cousin, in 1764. Here he confides to Bentley they lived like "married lovers;" he teaches her his curious cypher or shorthand in which he recorded the precious self-discovered secrets of his Art. He consults her sound wisdom and judgment on all matters relative to his business; she was truly his partner in all things. Much of his actual letter writing was done by his "Sally" when he suffered from an affection of the eyes. Sally's name is always coming up in correspondence; she is bringing up her young family, but has time to enter fully into all his schemes for improvement. A note occurs in a letter to Bentley, dated 24th October, 1767, showing how fully she shared interest in the business:—

"If you will have an Estimate, you must, & Sally says it will cost £250 at least. . . . an authority which I very seldom care to dispute."

It was because of the perfection of his improvement and invention that Wedgwood's cream colour ware inspired the other potters of Staffordshire to follow and it soon became the product that was being called for by all. The dealers introduced it into the houses of the nobility, and in this way the attention of Queen Charlotte, wife of George III, was called to it. This led to a definite order for some of it for her own use, and as Wedgwood was the only potter who was willing to undertake so great a demand, the commission was placed in his hands.

He supplied a tea service to St. James' Palace in 1765, and a full table service soon afterwards, which secured for him the title of "Potter to the Queen," and his new, delightfully potted, light coloured, and well glazed cream-colour received the name of "Queen's Ware," the shape being called the "Queen's pattern," which names are still used for this ware at the present time.

Orders now flowed in thick and fast, so that the Brick House Works became too small to cope with the demand, and Wedgwood purchased the Ridge House estate, where he built his new works, and a village to accommodate his workpeople, which he named "Etruria." Here they are to-day, enlarged and surrounded by a town which has claimed the country around and become part of the now important city of Stoke-on-Trent.

The culminating point of honour for his "Queen's Ware" was the order placed by the Empress Catherine II of Russia, whose "service" for every purpose of the table consisted of 952 pieces, each piece having a different British landscape painted upon it. For this Wedgwood searched the country for artists and subjects, and succeeded in making this service a National Work. Its fame was European. It was completed in 1774, after fourteen months' work upon it by "all available hands," and was for two months on show in the rooms at Greek Street, Soho, where all London flocked to see it.

Many failures are recorded, and difficulties at times seem to overwhelm him, but by a persistent, untiring course of careful and elaborate experiment, Wedgwood is able to bring to perfection many of his cherished schemes.

All these experiments were made with the materials known to the earlier potters, and his success with them led Wedgwood to the invention of his "Jasper body" with which his name is so completely connected; nothing like it had been seen before. His success with black, fine red, cane, incited him in his quest for a perfect vitreous unglazed ware which should be white throughout its whole substance. He made frequent references in his letters to "white porcelain," and this describes exactly the perfectly white and translucent material which is known by the name of Jasper.

He made incessant trials with all the white materials he could get, and although it has been repeatedly said that he was no chemist (indeed, it is doubtful if the chemistry of that day would have helped him much) he was able, by his untiring application and zeal and his careful method of recording and deducing, to make his labours abundantly fruitful. It is sufficient to say that no other potter succeeded in making this "body" except after learning Wedgwood's recipes. To ornament it he called to his aid artists of the greatest skill, among whom the most noted was John Flaxman, afterwards R.A., who supplied some of the first models, and was in Rome for twelve years utilizing some of the best modellers to work for Wedgwood.

Among the hundreds of ornamental pieces which were produced at Etruria, the one generally known as the most important is the "Portland" or "Barberini" Vase, for which alone he made some 600 separate trials, to get the texture, colour, and finish of the original.

Although last year publicity made the story of this wonderful piece of workmanship pretty well known, its history and that of Wedgwood's replica may be briefly told again.

The original vase was discovered close to Rome between the years 1623 and 1644. The date of its manufacture is A.D. 261, and the material cameo cut glass. During excavations upon a mound of earth called Monte del Grano on the road to Frascati, a sepulchral chamber was found to contain a sarcophagus of excellent workmanship; within this was deposited the urn which afterwards became known as the Barberini Portland Vase. The sarcophagus was placed in the Museum of the Capitol in Rome, the vase in the library of the Barberini family. After the dispersion of this library Sir William Hamilton, then the ambassador to Naples, purchased the vase from the antiquary, James Byres, and disposed of it to the Dowager Duchess of Portland. At the sale of her famous collection, in 1786, the Duke of Portland purchased it for £1,029. This nobleman, learning that Wedgwood had desired to acquire it, most generously placed it in the great potter's hands for the purpose of reproduction.

Wedgwood worked upon his replica of the vase for four years before he was able to issue a copy that satisfied him. Webber was the accredited modeller, but the relief figures were modelled twice, if not three times, before the "master" was willing to exhibit it. There was great difficulty in matching the colour, and the lathe work and polishing required much time, patience and practice. The first copy was not shown until 1790.

It is a popular fallacy, published repeatedly, that Wedgwood obtained forty subscribers at £50 each to become patrons. Wedgwood never made anything but a heavy loss on the work. A record price obtained for one of the original copies was £399, given at the "Proport" Sale in 1902.

The following copy of a letter from Josiah Wedgwood II to Messrs. Knight and Co., London, will be of interest:—

Maer, nr. Newcastle,
Staffordshire.

Febr'y 22nd, 1839.

GENTLEMEN,—It has been brought to my notice that in the Article on the British Museum in the *Penny Magazine* for January last, it is asserted that my late father, after selling 30 copies of the Portland Vase, broke the mould, that the price might not be deteriorated by the Article becoming common, and regret is expressed that so beautiful a specimen of skill should have been sacrificed to the aristocratic spirit of scarcity and high prices.

I assure you that the Author of the Article in question is misinformed; the number of copies was restricted by the difficulties and risks attending the execution of each copy, which were so great that I believe my father never sold 10 copies, and the moulds were not broken, but are still in my possession.

I am, Gentlemen,

Your Most obd't humble Servant,

JOSIAH WEDGWOOD.

Apart from his vases, Wedgwood's gems, cameos, intaglios and plaques are a complete study in themselves. These were produced for a variety of purposes for the architect, the furnisher, the cabinet maker and the jeweller.

A wonderful series of medallion portraits was also made in this "jasper" ware. There are over 350 of these which form a collection of great historical interest and display a beautiful technique in miniature sculpture.

The achievement of Wedgwood formed the incentive which has permeated the whole of the productions of the Staffordshire potteries; nothing has surpassed the technique which he displayed in all his work; his example is the stimulating force which still actuates the ceramic student to-day. He made ware that was imitated in his own day, and which has never ceased to be used as the head line for progressive improvement ever since.

As an inventor Wedgwood occupies an important place. At a time when the pottery industry in Staffordshire was quickly developing and throwing off the lethargy which had prevented any material change for so long a period, this intelligent and industrious young potter had an open eye and mind for any improvement, and seemed to grasp at once any suggestion, however slight, upon which he could work. His start as a "master" potter was certainly due to the discoveries he had made, which resulted in the invention of new wares, as well as new tools for producing designs, and effects which were quite novel.

One of his first inventions was the fine green glaze, and the beautifully designed and modelled dessert ware, which was made as long as he lived, and still continues to be a regular item of the manufacture to-day, for succeeding generations do not tire of it. His agate, marbled and granite wares, although developed from what others had made before, were altered by the great attention he bestowed upon the mixing of newly-found materials, the making of new shapes, the finely finished handles, shoulder bands and feet which were at times elaborately enriched with leaf gold. These pieces were not approached by any of his competitors and may range among his inventions.

The lathe in its simplest form had been in use in the potteries in the seventeenth century. At the time when Wedgwood started, several individuals were simultaneously making experiments to improve it. This fact in no way militates against the originality and inventive genius of Wedgwood, to whom is certainly due the discovery and invention of the method of *fluting* partly hardened bodies. He had studied Plumier's book, *L'Art de Tourner*, which furnished him with suggestions for altering and adapting the machine to a wholly different art, and so gave them the impress of original inventions.

He applied this type of decoration at first more especially to what was called "Red China," chiefly tea and coffee pots, of which he consigned large quantities to his brother in London for export to the Continent.

The growing taste and demand for classic vases led Wedgwood to invent a method of encaustic painting. The colours were enamel, which fired with a dead, or matt surface, and were applied to the black or red ware without any glaze.

The method of preparing these colours, as well as a bronze and a shining black, is found in a patent he applied for, and obtained in 1769.

One material which has never been surpassed is the Black Basaltes. This was used for every class of article, ornamental table ware, vases, busts, figures, medallions, intaglios. Its rich, bluish-black colour, hard, beautiful surface texture, which receives a brilliant polish on the lapidary's wheel, and the sharpness of detail retained, always has a fascination. This beautiful, unglazed, highly-vitrified black ware was peculiarly his own, although others approached very closely to it. He followed his usual plan at first and mainly made useful articles with it, and so was able to satisfy the prevailing demand of the period, for in none of his wares is the "classic" feeling more fully developed.

The Basaltes and Jasper clays, as well as the great variety of earthenware coloured clays, and the wares designed to utilise them were all introductions and inventions of Wedgwood.

When the "Queen's Ware" was perfected and continued to be made without alteration, a desire was created for a whiter ware, which Wedgwood invented a few years later and christened "Pearl Ware."

Many attempts had been made to invent some form of thermometer or pyrometer to register the greater temperatures reached in the processes of smelting metals and firing pottery, but they were skilful rather than scientifically correct; these, however, led Wedgwood to the invention of his pyrometer, as the *colour test* used. To regulate the heat of the potter's kiln was not to be relied on. These *colour tests* were beads made out of prepared clays which, when drawn from the oven at different heats assumed various shades, but as the slightest difference in chemical proportions of the mixture of clay, the fuel employed, and the vapours present in the oven, or the visual power of the fireman, rendered perfect accuracy impossible, the necessity for some more reliable test set Wedgwood's mind to work.

In May, 1782, Wedgwood communicated to the Royal Society his paper on the "Pyrometer," or heat-measuring instrument; two years later another paper was read, and in 1786 a third paper, so that his experiments extended over a period of six years. The subject was one which had in practice been before Wedgwood his whole life. His many improvements and discoveries in relation to clays, glazes and colours had depended upon certain degrees of heat, and therefore these papers were the embodiment of a long sequence of results, which led to observations of a highly scientific kind as to the relation of form to resistance to heat.

The *colour test* depends upon individual experience and is too uncertain to serve any general purpose. It then occurred to Wedgwood that the contraction of bulk by the action of fire on clay bodies, which proceeded regularly as the heat increased, was a more certain method of measuring heat. Upon these deductions he made his pyrometer, and although it is admitted by scientific men, and by its inventor, to be an imperfect instrument, it has stood the test of 150 years and is still used at Etruria.

As a result of these valuable labours, Wedgwood was elected a Fellow of the

Royal Society in 1783, at the same time as Priestley. He continued his experiments and contributed other papers on the subject of his improvements.

The state of chemistry in Wedgwood's day was very elementary as compared with the knowledge of to-day, and his chemistry must be judged from that standpoint; he was not a trained chemist, but he had the natural aptitude of one, and quickly developed the special gift when occasion demanded it.

His commonplace books are full of extracts and translations from books and journals, English and foreign, that have direct or even indirect reference to substances and processes connected with his own industry.

Dr. Mellor, F.R.S., Director of the Central School of Science and Technology at Stoke-on-Trent, has said:—"Wedgwood's private note books teem with records of experiments in Ceramic Chemistry which would be creditable were they published to-morrow." Some time ago Mr. Frank Wedgwood mentioned, in conversation to Dr. Mellor, that it seemed to him that Josiah Wedgwood's plan of carrying out his trials, as illustrated by the vast collection arrayed in the Etruria Museum, though methodical, was unscientific. Dr. Mellor's reply entirely disagreed; he said:—

"For the time in which he lived Josiah Wedgwood was splendidly up to date. The pure Chemist sometimes nurses the belief that pure Chemistry is on a higher plane and requires higher faculties than work in technical or industrial chemistry. The direct converse is nearer the truth. The industrial chemist is restricted by many limitations, the most important of which are imposed by the cost of the processes of manufacture and the supply of raw materials.

"The pure chemist is not hampered and restricted in the same way, and, in consequence, the industrial chemist works under the greater difficulties. There is also the problem of managing men. These points were recognised by Wedgwood, and an unpublished brochure in Wedgwood's own writing has some shrewd and interesting remarks on the art of managing men so as to get them working most efficiently."

Wedgwood was a true man of science, for he had knowledge and understood the facts that were revealed to him by observation, experiment and deduction. The enormous mass of trials numbered in thousands that can be seen to-day in the Museum at Etruria testify to the thoroughness with which Wedgwood did his work.

To quote once more from Dr. Mellor:—

"It is a pity that a great mass of work done by Wedgwood in what might be called the theory of pottery has not been published, since all will have to be repeated. If Wedgwood's work were available, the newer school could start where Wedgwood left off instead of spending decades in arriving at the same stage as he attained. For example, the recent 'lead *versus* leadless glaze' controversy would probably have been simplified had Wedgwood's notes on this subject been published. More than a century ago he appears to have reached a stage to which we have but recently arrived after much labour."

This suggestion has to a certain extent been acted upon, as any student can, by appointment, consult the MSS. and other data that are preserved in the Museum at Etruria.

Apart from the untiring energy and persistent experimenting which Wedgwood displayed for the advancement of the pottery industry generally by his inventions, his activities in other directions show his unfailing exertions to improve the conditions under which he and the other potters had to work.

Knowing full well from experience what "going to school" over six miles of hill and rough path daily meant to him between the age of six and nine years, he turned his attention to the children of his native town of Burslem. As soon as he had settled again as a young master potter, he began to arouse public attention to the fact that a school must be provided, and he started by securing a grant of land, upon which a school could be built, and opened a subscription list with a gift of £20, which was a considerable amount in those days, so that they were able to build the first school in Burslem.

His mind was always active in devising schemes for bringing the district and its products to the notice of various markets. His outlook reached far into the future; he knew that by serving others he was reaping reward for himself.

The condition of the roads around Burslem, which were then only mere tracks, was about as hopeless as anything could be for the transport of pottery from their works to even the nearest towns. Young, in his "Six Months Tour Through the Northern Counties," tells us that in eighteen miles he found three carts broken down and ruts four feet deep.

At that time carts were unknown in "The Potteries." Goods were brought into Burslem by pack horse, mule, or ass, with panniers on each side, or for shorter distances on men's, and even women's, backs. We can imagine how pottery in baskets on such journeys would suffer, and how heavier materials such as clay and coal would overcome the poor beasts who were cruelly beaten by their often besotted drivers. They floundered knee-deep in the muddy holes and were with difficulty raised again. It was wretched alike for man and beast.

As soon as the product of the district, the new cream colour ware, began to improve, orders increased rapidly. Wedgwood saw plainly that they could not cope with the demand as long as the condition of the roads remained as it was. It could no longer be tolerated, and it seems to have been left to him to make the first move. As soon as he had reached manhood he stirred up his brother manufacturers to realise that something must be done to bring "The Potteries" into closer touch with civilization. His was the initial pioneer work; he roused his neighbours, and he and they besought the "powers" of that day to better the condition of transport, and urged them to continue the turnpike roads, which were twenty miles away, through "The Potteries." Here again he encountered fierce opposition from vested interests, and fought against the antagonism that was shown by the neighbouring towns, who thought that their trade would suffer in consequence. Wedgwood spent much valuable time and money in fighting in this cause, until their efforts were successful in obtaining the Act from Parliament for the making of the roads.

And yet again—although his hands were full of his increasing business, necessitating his move from the first small “Ivy House Works,” after five years, to the larger “Brick House Works,” which in five more years again proved too small—he plunged fearlessly into the undertaking, which must have been a prodigious one to him at that time, of building an entirely new works on an improved plan on the Ridge House Estate. This estate he had purchased for £3,000, after only ten years as a “master” potter, an achievement which speaks volumes for his qualities as a business man, in addition to his success as a potter.

These Works were the first organised factory in the district, which he named “Etruria,” and here he started the separate ornamental department with Thomas Bentley as his partner, creating the motto “*Artes Etruriæ Renascuntur*,” suggested by the discovery of the beautiful vases which had been excavated and brought to England by Sir William Hamilton, the English Ambassador to Naples.

Here, in these Works, Wedgwood decided that the Arts of Etruria in Italy should be reborn in England, and it is this branch of his work and invention that has become attached to his name more than any other in the popular mind to-day. Close to the Works he built a village for his workpeople, probably the first garden village attached to a factory that England knew. While all this was going on, it did not prevent him from entering heart and soul into the scheme of the Duke of Bridgewater’s for providing inland navigation. Wedgwood spent so much time upon it that once he said in one of his letters: “I wish this bustle was over and I was quietly settled a potter only again.”

He never flagged in his devotion to the confidence placed in him, and it was due in a great measure to this that the Trent to Mersey navigation was completed successfully, which connected “The Potteries” by waterways with the east and west coasts of England, and greatly facilitated the transport of goods to the Continent on one side and America on the other.

The bicentenary of the birth of Wedgwood has arrived, and it is fitting that the whole industry should halt at the milestone reached and look back with thankfulness upon the difficult road by which progress has been made, but let us fully realise that milestones are not placed on the road for sitting upon; their chief use is to show how far we have still to go.

DISCUSSION.

SIR CHARLES J. HOLMES, K.C.V.O., F.S.A., paid his tribute to the extraordinarily interesting lecture of Mr. Barnard, and to his very remarkable series of slides. Nothing could illustrate the genius of Josiah Wedgwood better than a comparison between the wares which had been in existence in Josiah’s boyhood and those which had been in existence twenty or twenty-five years later. In that very short period of twenty or twenty-five years what had been a local art had passed into a fine art and an extremely useful art. That transition had been one of the most extraordinary which had ever been effected in the history of the arts. Personally he knew of no other period during which so entire a revolution had occurred in one of the oldest and most prominent of the crafts, because it had to be remembered

that the ceramic art was almost the oldest of all the arts, having a history of some six or seven thousand years. In this country that art, at the beginning of the 18th century, had been in a deplorable condition. From that condition it had been suddenly raised to one of the highest points which it had ever attained in its history by the single genius of Josiah Wedgwood. What had struck him even more than Wedgwood's genius in his art was his genius as a man of business. He had started in a small town in Staffordshire which had been cut off from the whole world. He had begun practising not only a rustic, but a local, art. He had been surrounded by difficulties of manufacture and transport which, one would have thought, would have crushed any industry. Nevertheless, in the course of his lifetime Josiah Wedgwood had succeeded not only in making art, but in creating a vast industry. When he (Sir Charles) thought of the difficulties which Josiah Wedgwood had overcome he could not help feeling that here and there amongst us there ought to be found people who were capable, in the same way, of overcoming the extraordinary difficulties under which industry laboured to-day. Of course, our difficulties were entirely different in substance from those of Wedgwood. We lived in a country which was over-taxed and over-administered. In every way to-day the burden upon a manufacturer was a very heavy one; but, after looking at the example of Wedgwood, he did not think that burden ought to be more than a manufacturer of energy and talent should be able to bear—and should be able to bear easily if he had anything like Wedgwood's determination. Nothing had impressed him more than the way in which Wedgwood not only conquered the conditions of his art, but conquered the conditions of his industry. He felt that the point of Mr. Barnard's lecture was the conquest of industrial difficulties by Wedgwood, and the making of what was an astounding business in the face of difficulties which were, he ventured to think, as serious for pottery in those days as they were for any industry in this country at the present time.

MR. JOHN WILLIAMS (Principal, Hammersmith School of Art) remarked that he had been intensely interested in hearing of Wedgwood and of his great skill and inventiveness in regard to pottery, and also his talent which had enabled him to make that pottery into an important industry. The great point for manufacturers in this country was to see whether they could not make their work as successful in its way as Wedgwood had made his art.

MR. W. SAVILL said it was his pleasure and privilege to propose a very sincere vote of thanks both to Mr. Frank Wedgwood for presiding and to Mr. Barnard for his very interesting, lucid and graphic resumé of the life of Josiah Wedgwood. Josiah Wedgwood must have been a fine character—the Grand Old Man of the pottery industry. The patterns of old "J.W.," as they had loved to call him at Stoke, of 150 years ago, were still being worked to to-day. The audience had seen on one of the slides that evening a cream jug dated 1791. He ventured to suggest that that design of cream jug had never been beaten. It was not only elegant, but it was practical. Mr. Barnard was full of his subject, and he was certain that every member of the audience had thoroughly enjoyed the lecture. With regard to the Chairman, knowing how busy a man Mr. Frank Wedgwood was, he could tell the audience the sacrifice which it had been to him to take the chair that evening. He was not going to eulogise the Wedgwood family. So much had been written, printed, and spoken about them, during the last two weeks particularly, that, out of respect for Mr. Frank Wedgwood, he would refrain from making further eulogistic remarks, especially as not only Mr. Frank Wedgwood, but the rest of the family, had already quite enough to live up to!

MR. E. R. EDIS said he was very glad of the opportunity of seconding the proposition, because for a long period he had been associated with the pottery trade, and had been brought into connection with the various ranges of goods manufactured by the great firm of Wedgwood. For a period extending over forty years it had been his privilege to have met not only Mr. Frank Wedgwood as the head of the firm, but his two predecessors, and it was a pleasure to put on record the fact that all three gentlemen followed the high traditions of their illustrious ancestor. They not only devoted themselves to the development of the old works at Etruria, but they interested themselves in the social life of the Potteries. The firm's workshops were the most important and finest in the Potteries, not only from the manufacturing point of view, but from the standpoint of the comfort of the workpeople—a side of the business which had always the first consideration with the firm. Mr. Frank Wedgwood had also interested himself on the educational side, and was a member of the Board of the Glass Trades Benevolent Institution.

The vote of thanks was carried unanimously.

Mr. Barnard and Mr. Frank Wedgwood having briefly acknowledged the vote, the meeting terminated.

WEDGWOOD BICENTENARY EXHIBITION

"It is as an English artist," Lord Crawford said in the course of his speech when opening the Exhibition at the Mansard Gallery at Messrs. Heals', in the Tottenham Court Road, "with English ideals and handling English material, that Wedgwood must always make his appeal—the Englishman admired by Sir Joshua Reynolds, or painted by Stubbs in the garden paddock, surrounded by his young family." The first Josiah belonged to an intensely English generation, which, however, owed much to classical ideals and was never reluctant to acknowledge its debt. To Wedgwood, Reynolds, the Adam Brothers, the artists and craftsmen of Antiquity were not *foreigners*, but the founders of sound and intelligent workmanship, the spiritual fathers of design. (The Adams were none the less English for being Scots.)

The history of Josiah's life is admirably sketched in a small book issued by Wedgwood's and obtainable at the Mansard Gallery; the writer relates how Josiah though not very well equipped materially at first, had the curiosity to pursue knowledge and the sympathy to attract friends of high capacity; how he experimented and gave others the chance of experimenting, until both artistic satisfaction and commercial success attended the efforts of the well-matched collaborators. This small book is a model of good taste; the facts are allowed to speak for themselves, and the tiresome hyperbole and sentimentality generally found nowadays in such productions are entirely absent. It is interestingly illustrated and charmingly printed. The genealogy at the end reminds us that Josiah was the grandfather both of Charles Darwin and of Charles Darwin's wife.

When, in 1759, Wedgwood first started on his own account, after working first as manager to John Harrison and afterwards in partnership with Thomas Whieldon, he confined himself for some years to making useful ware. And in spite of his later invention of the famous blue-and-white jasper ware, it is perhaps for his cream-coloured "Queen's Ware," everywhere in common domestic use, that we should most be grateful to him. His firm, under the guidance of successive

generations of his family, has kept its useful products up to an extraordinarily high standard ever since those early days of the Ivy House Works at Burslem. The lavender and honey buff services offered by Wedgwoods are hardly less attractive than the cream, and both the embossed decorations and the painted designs which appear on some of the sets are in accord with the restrained shapes and refined quality of the earthenware.

A green celadon tea service with bands of silver lustre, and a cream coffee service with silver decorations are among the attractive exhibits at Messrs. Heals'; prices are universally reasonable.

A number of interesting pieces are on loan at the Mansard Gallery until the 27th June, including seven examples lent by Her Majesty the Queen—among them a jug with cupids modelled by Hackwood and a cameo portrait of C. J. Fox modelled by Flaxman. The Etruria Museum has lent one of the original reproductions of the Portland Vase, and there are several early nineteenth century ornamental pieces showing all the good qualities in which Victorian art was, on the whole, deficient.

The exhibition also includes representative work by Mr. and Mrs. Alfred Powell, who have now long been associated with Messrs. Wedgwood. Such an alliance between industry and art is nothing new in the history of this great firm, who have recently also added the name of Sir Charles Holmes (formerly Director of the National Gallery) to the list of their eminent collaborators.

Two dexterous young craftsmen from Etruria may be seen at work in the Mansard Gallery, throwing pots, and occasionally, for the diversion of spectators, exquisite imitations of pork pies!

A special historical exhibition of Wedgwood ware is also being held for the next six weeks at the Victoria and Albert Museum.

CORRESPONDENCE

THE IMPORTANCE OF GERMAN AS A COMMERCIAL LANGUAGE

I was interested to notice in a recent number of the *Journal*, a letter from a Fellow, emphasising the importance of learning the German language in order to facilitate intercourse with a nation which is rapidly regaining its old position as our best client. In this connection it will not perhaps be amiss to point out that any young student who has matriculated for one of our universities—or any member of our learned societies—will find a ready welcome and a most friendly atmosphere in any German university, where he will enjoy all the advantages of the wonderful German educational system. A term spent in this way is far more instructive and interesting than mere sightseeing—not only from the language standpoint, but also from the point of view of obtaining an intimate acquaintance with the German people, their aims and aspirations.

Anyone who has had the privilege of this invigorating experience, and who has felt the impulse of these teeming thousands of hard-working, enthusiastic German students, can have little doubt of Germany's ultimate victory over her troubles; this time it will be a battle of *mind*, not of mere material *force*, and those who have the best trained minds will win.

The Prince of Wales long since voiced his cry "Wake up England," and it behoves perhaps our Society to stress a little more the fact that the problem is primarily

one of education and of the perfecting of an educational system. Germany's wonderful rapid advance between 1870 and 1914 was chiefly due to her technical educational system, and evidence is not lacking that again to-day this system is being continually perfected with unabated zeal and determination. Mere material advantages—as Rome and Spain found—will ultimately score little, and self-complacency is fatal.

S. J. E. BANKS, M.I.Mech.E.

OBITUARY

ARNOLD LUPTON.—Mr. Arnold Lupton, who died at his home in Westminster on May 23rd, at the age of 83, had been a Fellow of the Society for over 30 years. The son of Arthur Lupton, of Whittington, and Leeds, he was educated at home and afterwards apprenticed to a mining engineer. He was at one time a colliery manager and for a period of 21 years was Professor of Coal Mining at the Victoria University, now called the Leeds University, afterwards becoming a Consulting Mining Engineer. From 1906 to 1910 Mr. Lupton was Liberal M.P. for the Sleaford Division of Lincolnshire, distinguishing himself by his uncompromising radicalism. An antivivisectionist, an anti-vaccinationist, and a passive resister, he was always to be found among the supporters of unpopular causes. His "pro-Boer" sympathies involved him in a good deal of unpopularity during the South African War and during the Great War he made himself prominent as a pacifist. It was typical of his character that when the House of Lords rejected the Ballot Bill, then before Parliament, in 1868, he attended a large public meeting at Leeds when he was the only one who supported their action on the ground that secret voting was demoralizing and tended to promote cowardice—a view which he continued to hold to the end of his life.

MEETINGS OF OTHER SOCIETIES DURING THE ENSUING WEEK.

TUESDAY, JUNE 10.—Quekett Microscopical Club, at 11 Chandos Street, Cavendish Square, W. 7.30 p.m. Mr. R. H. Stoughton, "The Cytology and Morphology of Bacteria with special reference to Bacterium Malvacearum."

WEDNESDAY, JUNE 11.—Geological Society, Burlington House, W. 5.30 p.m. "Land Bridges across the Atlantic and Pacific Oceans during the Kainozoic Era," by the late Dr. H. von Thuring (communicated by Prof. Dr. J. W. Gregory).

Religions, Society for Promoting the Study of, at Caxton Hall, Westminster, S.W. 5.15 p.m. Professor Radhakrishnan, "The Theory of Re-birth."

University of London, at King's College, Strand, W.C. 5.30 p.m. The Right Rev. Bishop Gore, "The Idea of the Church and the Sacraments. Lecture III—The Theory of the Validity of Sacraments." At the School of Oriental Studies, Finsbury Circus, E.C. 5.30 p.m. Mr. W. P. Yetts, "Chinese Bronzes. Lecture IV—The Craftsmanship of Bronze Casting in China."

THURSDAY, JUNE 12.—Auctioneers' and Estate Agents' Institute, 20 Lincoln's Inn Fields, W.C. 3 p.m. Mr. H. V. Taylor, "Recent Developments in Fruit Growing."

Historical Society, 22 Russell Square, W.C. 5 p.m. Alexander Prize Essay.

FRIDAY, JUNE 13.—Astronomical Society, Burlington House, W. 5.30 p.m.

Malacological Society, at University College, Gower Street, W.C. 6 p.m.

Physical Society, at the Imperial College of Science and Technology, South Kensington, S.W. 5 p.m.

(1) Mr. E. J. Williams, "The induction of electromotive Forces in a Moving Liquid by a Magnetic Field, and their Application to the Investigation of the Flow of Liquids." (2) Mr. E. J. Williams, "The Motion of a Liquid in an Enclosed Space." (3) Prof. E. V. Appleton, F.R.S., "Wireless Methods of Investigating the Electrical Structure of the Upper Atmosphere." (4) Prof. C. R. Darling, "A Simple Method of Showing the Modes of Vibration of a Wire." (5) Demonstration by Dr. H. R. Lang on "A Modified Callendar Recorder for the Automatic Control of a High Temperature Oil Bath."

Royal Society, 21 Albemarle Street, W. 9 p.m. Prof. Henry Clay, "Unemployment."

University of London, at King's College, Strand, W.C. 5.30 p.m. Monsieur A. Maurois, "L'esprit moderne."

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No. 4047

FRIDAY, JUNE 13th, 1930

VOL. LXXVIII

*All Communications for the Society should be addressed to the Secretary, John Street,
Adelphi, W.C.2.*

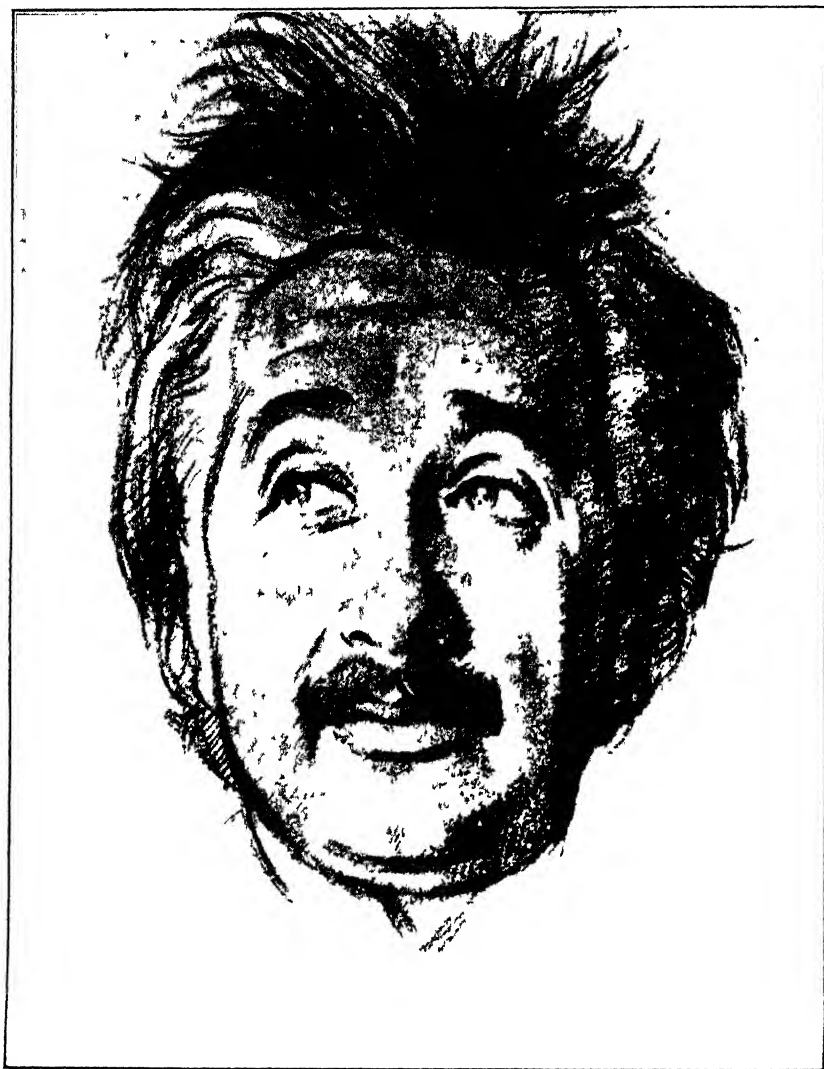
NEWS OF THE WEEK

"What is wanted is less easy generalisation about the æsthetic and intellectual capacity of Everyman, and more hard labour on the manufacture of communications between the artist who has something to say or to show, and the public whose receptive faculties are at present unemployed."

Ivor Brown.

A New Geometry of Space.—This is what Professor Einstein demanded at his lecture at Nottingham University on Friday, and one does not suppose that many people will be very much the wiser if he is able to give it to them. It was, nevertheless, a great privilege to be able to see Europe's greatest scientist at close quarters and to hear him make his charming little speech in German to the microphone. A curiously childlike, timid expression, wide open brown eyes, a tremendously powerful forehead and a bush of iron grey hair, these are the chief things that strike one about Einstein. He has no commanding voice or beetling brow, and yet one has never felt so overwhelmingly in the presence of a great man. As a matter of interest, we wonder what would have happened if the greatest film star or cricketer had come to Nottingham on Friday instead of the man who almost has the power to shake the foundations of human destiny!

Art and Industry.—The Wedgwood Bi-centenary seems to have made many people think furiously on this important and topical question. *Country Life* has published an excellent article dealing with this question in its broadest aspect. Wedgwood was a great example of a man who made a big



Albert Einstein

By kind permission of Prof William Rothenstein

commercial success by employing the best artists he could find to do his designs. He was up against tremendous problems and oppositions, but hardly the indifference which good industrial art has to face at the present time. *Country Life* quotes on the subject, D. H. Lawrence, who came of mining people and can speak from experience: "The industrial problem arises from the base forcing of all human energy into a competition of mere acquisition. The damage is done now. A people's loyalty to the beauty of life has been betrayed." The article continues:—"But the sanity that Wedgwood stood for has returned to our generation, and if, on the occasion of the great man's bi-centenary, politicians, industrialists and the press will consider what modern pioneers have done in the spirit that Wedgwood exemplified and Lawrence invoked, so a new life will enter into industry, if slowly and with difficulty—the life of the spirit, the life of beauty."

Theatres.—"HAMLET" in Shaftesbury Avenue.—Hamlet has certainly come into his own in the centre of commercial theatre land, for this last week the Old Vic Company and Mr. Moissi's German company have been playing side by side at the Queen's and the Globe. Unfortunately, we cannot speak of the German production except to congratulate Mr. Maurice Browne and Mr. C. B. Cochran on their effort to give London a really interesting International Season, but of the Old Vic Hamlet (brought to the West End by the same enterprising management) we cannot speak too highly. It is beautifully produced and lighted—one or two of the effects are quite exceptional in this respect, especially the lighting of the background in the ghost scene, and the wonderful effect of the scarlet curtain drawn across some of the more sombre settings. But over and above all this there is Mr. John Gielgud's Hamlet, which has beauty and reality and poetry. One of the great merits of his performance is that while having a wonderful sense of the music of the words, he never lets this suffice, which so many people do almost unconsciously, and as a consequence let the meaning go. The meaning is always there. His youth also is a tremendous asset in getting that pathetic bewilderment which is so much a part of Hamlet and which many of the older and more thoughtful performers are unable to convey.

Books.—*STRANGE COMBAT*, by Sarah Salt.—Those who have followed Miss Salt's work from "Sense and Sensuality" and "Joy is my Name" to this, her latest work, will see how she has steadily gained in her swiftness of grasp and her extraordinary rendering of the psychology of modern life. She is still obsessed by the tragic and hopeless aspects, but not abnormally so, as are many of her contemporaries. In "Strange Combat" she ruthlessly tears out the soul of a rather passé woman journalist who has an absorbing passion for a young

boxer. Her economy of words and skill in leading up to the tragic climax are magnificent, but one cannot help quarrelling with the last page, which is the only piece of unreality in the book.

THE UNCELESTIAL CITY, by Humbert Wolfe.—This important event in the world of poetry concerns the journey of one Mr. Crayfish, who has reached the eternal city and retraces his steps through life commenting satirically, seriously and sometimes lyrically on people and ideas. The whole book is bursting with material and unlike some of the "slim volumes" which appear, their scanty and precious contents spun out with the aid of two or three lines on a page, one feels that Mr. Humbert Wolfe is sadly limited by his 250! Though a great deal is almost obscured with the effort for expression and the lines are sometimes left in all sorts of shapes, there is a beauty and sincerity all through that makes the reading of this book like a walk through a garden after the rain, even though there is sometimes a cold wind of satire at our backs.

Paintings by Polia Chentoff at the Brandon Davis Gallery.—This young Russian artist has uncommonly good technique, and one is forced to admire the way in which she has her medium under perfect control, even if at the same time we do not consider her paintings altogether pleasing. There is a curious grey flatness about them which is beautiful in a rather negative way, and yet one cannot help wishing that she would make more use of the flashes of colour which occasionally appear in her work. There is a great fashion now of putting on colour like clay, which is effective in moderation but, as in this case, it is apt to be a little monotonous.

"The Leasowes," Halesowen.—As long ago as August, 1929, the Royal Society of Arts called attention to the subject of the neglect of Shenstone's house and gardens. Since then spasmodic correspondence has been going on in regard to this. The Society appealed to the University of Birmingham and the architects to interest themselves in the preservation of a house which is so associated with eighteenth century literature. It is not a case for an appeal, but for Birmingham and the neighbourhood to consider whether it is not to their advantage to preserve from irresponsible development a place which possesses such interesting associations. An eloquent appeal was made in *Country Life* by Mr. Hussey; and the late Mr. Charles Whibley, an authority on the period, followed by an article in *Blackwood's*. We are glad to see that *The Daily Telegraph* has secured the services of the Dean of Winchester to champion the cause of Shenstone and his circle. No one knows the period better, or is more informed on its literature, and there does seem now some chance that all enlightened people in Birmingham will consider seriously whether something cannot be done to save this property. The worst of publicity is that it increases the value of such properties, but the owner is a native of

Halesowen, although resident in Cheltenham, and we are sure that he will consider the question of letting his native town have this property on the most favourable terms. If the Golf Links are properly developed there is surely no harm in it remaining a place of recreation. The Club House could be restored with discretion, in a manner that would be approved by the late owner. One room, it is suggested, might be devoted to books and pictures dealing with the architecture and gardens of this scholarly period. We refer our readers to the many notices in the *Journal* on this subject.

NOTICES

ANNUAL GENERAL MEETING

The Council hereby give notice that the One-hundred-and-seventy-sixth Annual General Meeting, for the purpose of receiving the Council's Report and the Financial Statement for 1929, for the election of Officers, and to consider the sale of ground rents at Clapton, will be held, in accordance with the Bye-laws, on Wednesday, June 25th, at 4 p.m.

(By Order of the Council),

GEORGE KENNETH MENZIES,

Secretary.

COUNCIL

A meeting of the Council was held on June 2nd. Present :—Mr. Llewelyn B. Atkinson, M.I.E.E. (in the Chair) ; Sir Charles H. Armstrong ; Lord Askwith, K.C.B., K.C., D.C.L. ; Mr. Alfred C. Bossom ; Sir David T. Chadwick, C.S.I., C.I.E. ; Captain Sir Arthur Clarke, K.B.E. ; Sir Edward Gait, K.C.S.I., C.I.E. ; Rear-Admiral James de Courcy Hamilton, M.V.O. ; Mr. P. Morley Horder, F.S.A. ; Sir Herbert Jackson, K.B.E., F.R.S. ; Sir Philip Magnus, Bt. ; Sir Reginald A. Mant, K.C.I.E., C.S.I. ; Mr. John A. Milne, C.B.E. ; Mr. Carmichael Thomas, and Lieut.-Col. Sir Arnold T. Wilson, K.C.I.E., C.S.I., C.M.G., D.S.O., with Mr. G. K. Menzies, M.A. (Secretary), and Mr. W. Perry, B.A. (Assistant Secretary).

The following candidates were duly elected Fellows of the Society :—

Briggs, Frederick John Mark, Chard, Somerset.

Brown, Mrs. Jean Curtis, London.

Bullivant, Lindsay Frank, Birmingham.

Edwards, William Franklin, Englewood, New Jersey, U.S.A.

Gale, Henry G., Ph.D., Chicago, Illinois, U.S.A.

Gary, Mrs. Elbert H., New York City, U.S.A.

Hamblin, Alec Edwin, Aylesbury, Bucks.

Janaki-Ammal, Miss Edavaleth Kakkat, University of Michigan, U.S.A.

Jones, Sir Edgar R., K.B.E., London.
Kennard, Mrs. H. A., London.
Lawrence, Howard B., East Orange, New Jersey, U.S.A.
McLeod, Miss Jane, Edinburgh.
Neidig, Dr. Ray E., M.S., Trail, B.C., Canada
Patrick, Mrs. Gertrude, London.
Raistrick, Joseph Edward, Wellington, New Zealand.
Read, Mrs. Florence, Brighton.
Scott, Michael, Dublin.
Seeley, Robert James, London.
Turner, W. J., London.

The terms of the award of the Society's Albert Medal for 1930 were settled. (See below).

The draft Annual Report of the Council was approved for submission at the Annual General Meeting.

The sale of certain ground rents at Clapton owned by the Society was approved for submission at the Annual General Meeting.

The programme of lectures and papers for the forthcoming session was considered.

Mr. Alfred C. Bossom was re-nominated to represent the Society on the Board of Architectural Studies for 1930-1.

A quantity of financial and formal business was transacted.

THE SOCIETY'S ALBERT MEDAL

The Albert Medal of the Society for the current year has been awarded by the Council, with the approval of the President, the Duke of Connaught, to Professor Henry E. Armstrong, F.R.S., "for his discoveries in chemistry and his services to education."

The medal was founded in 1863 as a memorial to Prince Albert, for 18 years President of the Society, and is awarded each year "for distinguished merit in promoting arts, manufactures, and commerce."

HISTORY OF THE ROYAL SOCIETY OF ARTS

Further copies of the History of the Royal Society of Arts by the late Sir Henry Trueman Wood, the existing supply of which was recently exhausted, are now available, and can be obtained, price 15s. net, on application to the Secretary. The History, a large octavo volume of 558 pages with a large number of illustrations, gives a well documented account of the many and various activities of the Society from its foundation in 1754 to the year 1880.

REPRINT OF CANTOR LECTURES

The three Cantor Lectures on "Wind Instruments from Musical and Scientific Aspects," by Dr. E. G. Richardson, Ph.D., D.Sc., Lecturer at University College, London, have now been reprinted in pamphlet form (price 2s. 6d.), and can be obtained from the Secretary, Royal Society of Arts, John Street, Adelphi, W.C.2.

A complete list of Cantor, Howard and other lectures, which are available in pamphlet form, can be had on application.

PROCEEDINGS OF THE SOCIETY

DOMINIONS AND COLONIES SECTION

TUESDAY, MARCH 25TH, 1930

· COLONEL SIR HENRY LYONS, D.Sc., F.R.S., Director, Science Museum, South Kensington, in the Chair.

THE CHAIRMAN said the paper that afternoon was by Mr. Howarth, whom all present knew as the Secretary of the British Association, and who, in that capacity, had arranged the annual meetings of the Association for a considerable number of years. For that reason he was in a better position than almost anybody else to tell the company present of the relation of the British Association with the Empire as a whole, a relation which was based on the periodical visits that the Association had paid to the Overseas Dominions a number of times in the course of the last half-century.*

The following paper was then read:—

THE WORK OF THE BRITISH ASSOCIATION IN RELATION TO
THE EMPIRE

By O. J. R. HOWARTH, O.B.E., M.A.,
Secretary of the British Association for the Advancement of Science

It is probably unnecessary to remind this audience, in detail, of the nature of the annual meeting of the British Association for the Advancement of Science. It is held, in any given place, not, in the first instance, of the Association's own motion, but by invitation from the administrative body of the place, the university if such there be, or any other appropriate local authority. The period of the meeting is devoted to the hearing of addresses, lectures, papers, and discussions, partly in general session, but for the larger part in sections. Excursions provide opportunity for field work, or at least for acquiring ocular evidence of work done; and there is always a generous measure of hospitality. Whatever form this last may take, none of it should be despised as mere recreation, for all of it affords opportunity for personal intercourse between the cultivators of science—to revive the ample phrase of our founders—and this personal intercourse, free of the

formalities of the lecture room, is an immensely important attribute of the meetings. The present Secretary of State for the Dominions said in a recent speech that there is much to do in the way of weaving social tissue between the different parts of the Empire. For one element of society at least—the scientific element—the British Association by its meetings overseas is helping to do just that thing.

The British Association was founded in 1831, and even at that time one of its founders had sufficient prevision to say that “the foundation of a general national institution has been laid, which, fixed to no spot, is free to range from city to city of this great empire.” Actually, the ship of the Association has been navigated for more than half a century in weather generally fair, if occasionally something foul, when (substituting fact for metaphor) it first set sail to hold one of its annual meetings overseas. This was in 1884: the meeting was in Montreal, and the original proposal to hold it there raised the noisiest storm the Association had ever encountered. It is strange now to look back upon the opposition which was evoked by the proposal to meet overseas. That opposition may perhaps have had its origin in a profoundly-rooted conservatism not uncharacteristic of the time; at any rate its avowed reasons seem feeble now. It was urged, for instance, that there was no science in Canada; even if that had been true, one of the primary objects of the Association was, and is, to import science where it is needed. It was urged that a meeting overseas would be merely a glorified picnic—a criticism passed upon British Association meetings both before and since 1884. But a dictionary definition of a picnic is “a pleasure party including meal out of doors”; and the members of our field sections, such as geology, geography, zoology, botany and agriculture, must be well accustomed to taking meals out of doors, not without pleasure, in the course of their scientific avocations. A measure of very natural opposition to meetings overseas must always exist in the minds of those who may be unable to take part in them, and from their standpoint it is perhaps unfortunate that the Association has not yet reached the stage of holding a meeting both at home and abroad in any one year. That would seem a not unnatural evolution, for it has come to be recognised pretty generally that in holding meetings overseas from time to time the Association is performing one of its most important functions. The Royal Charter, recently acquired, specifically licenses it to do this: the Association is thereby empowered “to hold meetings of the members of the Association or public meetings at such times and in such places in our United Kingdom or in Our Dominions, Colonies or Dependencies or elsewhere as the General Committee of the Association shall determine for the reading, hearing and discussing of scientific lectures or communications, and to hold or promote exhibitions of instruments, specimens and things and to promote intercourse between persons concerned or connected with Science.”

It has been suggested already that, at any rate in connection with a meeting overseas, the pregnant words in that clause of the Charter are “to promote intercourse.” From the point of view of the visiting members at an overseas meeting—ourselves, that is to say—the Prince of Wales defined the position in his presidential

address to the Association at Oxford in 1926. "Any labour which time allows us to spend" (he said) "upon the advancement of scientific knowledge of the Empire, of the means and manner and environment of life in its component territories, must be well spent. . . . Those of our members who have travelled from this country to take part in these meetings have had peculiar opportunities to meet and discuss each his own scientific problems with fellow-workers in the Dominions. . . . Our travelling members have been able to see how science is cultivated in the universities of the Dominions and in many other institutions; they have gained first-hand acquaintance with the special problems of one territory and another; and when they have returned home they have talked—as anyone who travels the Empire is impelled to talk," and he added: "I have myself been guilty of giving way to this impulse once in a while."

So much for the visiting members: as for the point of view of those who received us recently in South Africa—which, it may be hoped, is typical of the other territories we have visited—half-a-dozen words from General Smuts, in a letter to one of the officers of the Association, sum the matter up: "It did us no end of good." We must not pass the name of Smuts without reference to an announcement made a few days ago. The Centenary Meeting of the Association will be held next year in London, and the announcement was to the effect that the Council had decided to nominate General Smuts as president of the Association for that occasion, and that he has accepted nomination. The happy relation of that announcement to the subject we are discussing needs no comment.

The Association has held seven overseas meetings in 45 years—four in Canada, two in South Africa, one in Australia. The Canadian meetings have been confined each to one city—Montreal, Toronto (twice), and Winnipeg—though all of them have afforded opportunities for widespread scientific activities in the Dominion. The Australian and South African meetings, however, were spread over more than one centre: in Australia meetings (as distinct from individual lectures) were held in all five of the then State capitals of the mainland. The actual dates of the overseas meetings have been:—

Montreal	..	..	1884	Australia	..	..	1914	(the Great
Toronto	..	..	1897	War broke out	while we were there.)			
South Africa	..	..	1905	Toronto	..	..	1924	
Winnipeg	..	..	1909	South Africa	..	..	1929	

We may now attempt a cursory view of the circumstances, and by way of example cite a few of the results of these meetings.

The first idea of a meeting in Canada appears in 1881, the jubilee year of the Association. It took a while to overcome the opposition which has been referred to already, and the then Marquis of Lorne missed the opportunity he would have welcomed, for he ceased to be Governor-General of Canada in 1883. He had conveyed to Canada a strong scientific family tradition, for his father, the 8th Duke of Argyll, had been president of the Association in 1855, and in addition to

his public activities was a man of no mean scientific achievement according to the earlier scientific lights of his day, being a geologist of the catastrophic school and a stout opponent of Darwin. His son prepared the way for the Association in Canada; a Conservative government, well established in power but nevertheless full of energy in the development of its new and splendid territory, was favourable to the visit and gave it financial aid. These were the spacious days when ocean fares were cheap and free railway passes were not unknown; and over 900 members made the journey across the Atlantic. In parenthesis: as in later years the Association went further afield and the cost of travelling increased, we have not again attained such a figure; but that is not a measure of the relative success of meetings overseas. A prime function of such meetings must be to bring as large a body as possible of the educated citizens of the Dominion visited into contact with a representative body of visiting scientific workers, from all departments of science. Therefore, when in 1914 the Association was enabled to send to Australia 300 visitors, qualified in the major part as representative scientific workers, that achievement in itself was good; but the measure of the success of the meeting was the total enrolment of over 5,000 persons in Australia—nearly one per thousand of the total population of the country.

Reverting to Canada: the headquarters of the meeting in 1884 were in the old-established McGill University of Montreal, which benefited as it deserved after the meeting by the establishment of funds for "philosophical apparatus," and for the provision of medals for annual award for proficiency in applied science. This precedent of founding a medal in commemoration of British Association meetings was followed later in South Africa and in Toronto. The president at the Montreal meeting was Rayleigh, who at the close of his presidential address conveyed a message to the younger scientific workers of that young country, in a sentence worthy to quote many times, for its balanced beauty of phrase no less than for its sentiment. It was this: "The work may be hard, and the discipline severe; but the interest never fails, and great is the privilege of achievement."

The second and third Canadian meetings moved westward as the country developed; the second was held in Toronto in 1897, the third in Winnipeg. Winnipeg, which members visiting it in 1884 from Montreal had found to be a settlement of low buildings, plank sidewalks, and roads unmade over the surface of the prairie, was by 1909 ready to receive the Association in the University of Manitoba, and to reveal itself to them as the metropolis of the central plains of Canada. In 1924 the Association was back in Toronto, where again the University was our headquarters. A notable line of presidents followed Rayleigh at these three meetings—Sir John Evans, Sir Joseph Thomson, and Sir David Bruce.

Each Canadian meeting has been followed by a journey to the west: railhead reached only to Laggan in 1884, but later visitors were conveyed across the continent to Vancouver and Victoria. Those of us who have been privileged to take part in more than one of these meetings received a remarkable object-lesson in the rapid westward extension not only of material but also of cultural development

in Canada. When we crossed the continent in 1909, for example, the scientific interest of things seen was manifold, and there were those who were ready to listen to the messages of science when given not too difficult expression ; but there were very few to meet the visiting scientific workers on their own ground. Speeches were words of welcome, of pride of country, of imperial brotherhood, and suchlike admirable topics of common application. But in 1924—after only 15 years—we were received at such fine new universities as those at Saskatoon and Edmonton, and the scientific workers were there on the spot, to demonstrate to the visitors the interests of their respective areas, to show them the results of their work, and to discuss their problems with them. In those 15 years the development of science in western Canada was very rapid ; without doubt it continues ; without doubt the visits of the Association have in a measure contributed to it, and it may well be hoped that some of us will yet see a meeting of the Association somewhere on the further side of Winnipeg.

It would be impossible here to analyse all the programmes of the overseas meetings of the Association, though it may be permitted to do so presently, by way of example, for the programme of the latest of them, that in South Africa last year. Meanwhile, a few clues to the after-effects of our overseas meetings may be discovered, again by way of example only. In doing this, I shall venture to quote with some freedom from the historical summary published in 1922 under the title of "The British Association : a Retrospect." It is impossible (says that record) fully to assess the scientific results of any overseas meeting of the Association. Important results may spring, and have sprung, from conversations at chance meetings between visitors and hosts : such results may, more probably than not, go unrecorded. One such accident comes to my mind as an eye-witness. We were conveyed to an entertainment in a Canadian city by municipal tramway cars, which we overcrowded. Two distinguished visiting engineers, one of our Canadian hosts, and myself, were among others packed precariously on the rear platform of a car. It was evidently their position which inspired the engineers to start upon a discussion of a system of electrical transmission then new. The Canadian intervened to introduce himself as the mayor of the city, deeply interested in that very system of transmission in relation to that very tramway ; an appointment was made for the following day, and that municipality no doubt was the richer for an expert opinion from without. A trivial incident in itself perhaps ; but the cumulative effect of such incidents is not insignificant.

More definite clues to the influence of Association meetings in Canada are found by reviewing resolutions which the various sections, as the result of discussions during their sessions, may put forward for the consideration of the Committee of Recommendations and the General Committee, after which the Council may take action upon them. Further clues are afforded by subjects of research for which the Association itself has appointed committees. Thus, after the first Canadian meeting, the Council made representations to the Dominion Government on the importance and desirability of improving tidal observations on the Canadian

Atlantic coast, and of encouraging investigation of the Indian tribes of the Dominion. Committees were appointed to facilitate both these objects, and also to report on fishery conditions and marine biology. In quite another direction, the Canadian committee for this meeting took over a series of papers on Canadian economics, presented to the Section of Economics, and published them in book form—an interesting development, probably not unconnected with the fact that the Dominion election of 1878 which brought Sir John Macdonald and the Conservative party into power, of which the party kept hold for eighteen years, was fought mainly upon the so-called “national” policy of protection for Canadian industries, which had “had almost immediately the effect of lessening the exodus of artisans to the United States, and of improving the revenue and so restoring the national credit.”*

When the Association met in Toronto in 1897, visiting members were so strongly impressed with the agricultural experimental stations established in Canada that it was recommended that the Council should approach the home government with a view to such stations being imitated in Britain. Therein they showed prescience; but the Council, modifying the recommendation, urged upon the Board of Agriculture the desirability of co-ordinating existing institutions for agricultural research and strengthening the scientific work of the Board itself; and there is no need to enlarge upon the way in which such a policy has been carried out in the last thirty years. A tidal survey of Canadian waters had been started since the Association's meeting at Montreal in 1884; it was found in 1897 to be in danger of extinction, but a recommendation removed that risk. A committee was formed, with a grant of money from the Association, under which a plant for meteorological observations was established on Mount Royal at Montreal. Another committee secured the establishment of a marine biological station in the Gulf of St. Lawrence; a third undertook investigations of Canadian Pleistocene flora and fauna. The committee on the Indian tribes of the north-west, appointed at the Montreal meeting, was still at work, and another, with the Toronto meeting in prospect, had been appointed in 1896 to take up an ethnological survey of Canada, and subsequently presented a series of reports.

By the example of this last topic it is possible to illustrate a certain continuity of influence which the Association has exercised in the Dominions, even though its visits to them be separated by long intervals of years. For at the meeting in Winnipeg in 1909 a new committee was appointed to further the scheme for the ethnographic survey of the Dominion, and the Council took action to the same end, which led to the establishment of a department of ethnology under the Geological Survey. The Association's work in this direction, therefore, was done; it had in this matter discharged a function characteristic of it in many other directions—and characteristic, also, I believe, of the Society which I have now the honour to address—that of initiation.

*Dr. G. R. Parkin, in *Encyclopædia Britannica* 11th ed., V, 162.

Another committee appointed at the Winnipeg meeting undertook the investigation of the flora of the prairie provinces. A full report was printed of an important series of communications on wheat culture and agricultural development. One interesting development arising out of this meeting was a collection of books, journals, and reprints made in England from members and learned societies for presentation to the library of the University of Manitoba, as some return for the hospitality extended to the Association by that then youthful institution.

Examples of guidance or suggestion offered to government departments, or of investigations undertaken by research committees, have become, so far as Canada is concerned, a less obvious feature by the time of the last Canadian meeting, that at Toronto in 1924. It is natural that this should be so. I have already referred to the immense developments in the cultivation of science which were visible to those of us who crossed the continent in 1909 and again in 1924—even within that short period of 15 years. The transcontinental journey has been a feature of each of our Canadian meetings, and the journey connected with the Toronto meeting in 1924 may be taken as our example, because it was the most comprehensive of the four ; and because the organised tour forms a definite and important part of the Association's activities in relation to the Dominions. A sight-seeing trip across Canada is in itself one of the easiest and most enjoyable long-distance journeys in the world ; but a sight-seeing trip with a scientific bias is also one of the most continuously instructive.

Before the meeting began in Toronto, there was opportunity for official visits to Quebec, Montreal, and Ottawa ; and most of the 577 members who attended the meeting from this side of the Atlantic Ocean were able to take part in these. The transcontinental tour proper began from Toronto after the meeting, and about 360 persons took part in it. The journey was made outward to Vancouver on the lines of the Canadian National Railways and homeward on those of the Canadian Pacific ; each of these great railway systems provided a train for the complete journey. Perhaps their friendly rivalry helped to ensure the perfection of comfort which the travellers enjoyed. I recall that the remarks of one of the train crews left nothing to be desired when the locomotive of the other train blew out a cylinder head. That tour, outward by one route and back by another, enabled us to view the mining areas of Northern Ontario and the agricultural possibilities of the Clay Belt, to renew our friendly recollections of Winnipeg, the capital of the prairies, to cross the prairies themselves and the western mountain system along two lines, giving us the widest possible views of the vast extent of the one and the beauties of the other, and to visit such centres of industrial activity and scientific interest as Cobalt, Saskatoon, Edmonton, Vancouver, Victoria, Calgary, Regina, Kenora, and Sudbury. In the course of the tour, which lasted 17 days, some forty lectures were given by members. Several of these occurred in the course of special sectional meetings held in the University of Saskatchewan at Saskatoon, where the sections of chemistry, geology, zoology, and agriculture organised programmes, the first participating in the opening of the new chemical building. At the University of

Alberta, Edmonton, similarly, the sections of mathematics and physics, geology, botany, and agriculture held meetings. Particular visits or deviations were arranged to suit special interests: for example, the geologists of the party were afforded opportunity, under expert local guides, for investigations in the mineral fields of Northern Ontario, at Stony Mountain, Manitoba, at the Capilano Canyon and the Britannia copper mines near Vancouver, at Mount Stephen in the Rocky Mountains, and at the head of Lake Superior near Fort William. The botanists made an extended side-trip in the neighbourhood of Lake Timagami (Ontario), and some of them travelled across country from Edmonton to Banff in the Rocky Mountains. The zoologists paid a visit to Nanaimo in Vancouver Island. The agriculturists received special attention in the Clay Belt of Northern Ontario, and in the prairie provinces. And so forth; but so numerous were the opportunities presented to the whole party to study the utilisation of the natural resources of the Dominion that all interests were constantly engaged. The economist members could intrigue themselves with conditions and types of labour, with the mechanism of wheat transport, with the welfare institutions of Winnipeg, and the like. The engineers had opportunities arising not only in the course of the railway journey, but also in relation to the use of water powers and electrical transmission. All interested in education—which implies practically the whole party—viewed with satisfaction not only the remarkable development referred to already in relation to university education in the west, but also that of the schools. Reverting to the special interests of the biologists, both botanists and entomologists took advantage of that atmosphere of informality which still is inherent in North American railway travel, and used every daytime halt of the trains, however brief, to get out and collect specimens in the neighbourhood of the track. The scientific results of these escapades were very far from negligible; these apart, there remain with some of us many visions of enthusiastic field-workers nearly left behind; also, incidentally, the pleasant remembrance of a burlesque of their activities staged by one of the negro train-staffs, who, on one occasion of a wayside stop, burst forth from the train with loud cries, improvised butterfly-nets, and other appropriate manifestations.

This, then, is a brief description of a typical British Association journey, such as have taken place in Canada, Australia, and South Africa. And these in brief have been the relations of the British Association with the Dominion of Canada since 1884; save that before leaving them mention must be made of the happy relations also engendered with the American Association for the Advancement of Science, and with American science generally. For it was after the first Canadian meeting that Sir William Thomson (afterwards Lord Kelvin) and other British representatives proceeded to the meeting of the American Association at Philadelphia, and from there a company including Rayleigh and other leading physicists, American and British, went to Baltimore for Thomson's famous series known as the Baltimore lectures, which were given at the instance of the authorities of Johns Hopkins University. At every meeting of the British Association in Canada

many American members have been welcomed : at Toronto in 1924 there were about 800 of them. And a joint meeting of the British and American associations is a happy suggestion emanating from the American side, which perhaps in the future may be given effect.

Reference has been made already to the meeting in Australia in 1914. The possibility of a meeting there was discussed as early as 1884, when the success and value of the first Canadian meeting had proved itself. The time was not then ripe ; but the question was raised again in 1909 (the year of the Winnipeg meeting) when Sir Charles Lucas, then head of the Dominion Department of the Colonial Office, was visiting Australia. The way was now made clear for the most elaborately organised meeting which the Association has held. The Commonwealth Government contributed £15,000 for distribution as grants in aid of travelling expenses to invited representative scientific workers ; it also defrayed the expense of the federal organisation of the meeting, and contributed to the official entertainment. The State Governments granted free travel for visiting members over their railways, and contributed to the costs of the meeting, each within its own territory. The principal steamship companies afforded special rates, and, among other facilities, opportunities for scientific research at sea, such as marine biological investigations and observations on the force of gravity. The British Association, as personified in its travelling members, does not waste time while travelling. All these arrangements, it should be added, again are typical in connection with meetings overseas, excepting the provision of free railway travelling, which necessarily cannot always be enjoyed.

The meeting began with the assembly of a portion of the party at Perth, Western Australia, where lectures were given and excursions took place. The whole visiting party was united at Adelaide, where meetings both general and of some of the sections were held. Both at Melbourne and at Sydney there was carried out what amounted to a full ordinary programme. The President, William Bateson, delivered part of his address in each of these two cities, and all the sections met. At Brisbane, whither about two-thirds of the visitors proceeded, there was a full programme of lectures, and the meeting, despite the outbreak of war, was brought to a successful conclusion. Every Section remarked upon the extraordinary opportunities which were arranged to enable the visiting members to see what they should see and to discuss what they should discuss with their Australian colleagues. Special facilities were arranged for members who wished to prolong their stay in order to carry out research or inspection, and a considerable number took advantage of this. It is impossible here to enter into further detail, but it can be stated, and illustrated by example, that valuable links were permanently established in a number of directions. The representatives of cosmical physics, for instance, had the opportunity to set on foot the establishment of a solar observatory in Australia. Under a committee inaugurated since the war by the Association, an important investigation of the Great Barrier reef has been carried out recently. Anthropological investigations upon the aborigines have in recent years been watched with interest,

and recommendations have been offered. The permanent contact of the Association with Australian science may be regarded as secure.

In South Africa our last meeting took place last year. The first was in 1905, when under the inspiration of Sir David Gill and the presidency of Sir George Darwin a meeting was held which left impressions upon the advancement of science in South Africa that we found to be by no means forgotten in 1929. The course of both meetings was similar, the full programme of an ordinary meeting being carried out (broadly speaking) both in Cape Town and Johannesburg, while there were official visits to many other important centres, by travelling parties, both in the Union territory and in Southern Rhodesia and elsewhere; notably in 1929, in Kenya. While we cannot deal further here with the meeting in 1905, we may do so briefly with that of last year.

It has been indicated already that an overseas meeting of the British Association involves heavy expense. Expenditure on the ordinary items of organisation are necessarily increased. Moreover, in spite of the help which the shipping companies and the railway administration in South Africa generously furnished by way of reduction in fares, the cost of the journey would have been beyond the resources of most of our practising scientific workers, many of whom were assisted with grants in aid of travelling expenses. A liberal subsidy was given by the Government of the Union of South Africa to the South African Association for the Advancement of Science, which enabled that body to couple with its invitation to the British Association to go to South Africa the offer of substantial monetary help. This was supplemented by a fund raised at home, thanks to the generosity of commercial organisations and private individuals interested in South Africa. The total sum involved was £20,000.

It would have been tedious, even if it had been possible, to analyse the scientific programmes of all our overseas meetings in relation to the Dominions where they have been held. But here is a brief attempt to apply this process to last year's meeting as the most appropriate example at the present moment. The programme in Cape Town and Johannesburg included some 350 addresses, lectures, papers and discussions in all. Of these, fully one-third were on specifically South African topics, and many of them were contributed by South African scientific workers. Only a few need be mentioned as examples. The chemists dealt with essential oils from South African plants, with recently-discovered nitrate deposits in South-west Africa, and with the chemistry of gold extraction. The geologists were concerned in very large measure with the geology of the sub-continent: they not only heard papers on it, but studied it widely in the field, co-operating with the International Geological Congress (which coincided with our own meeting) in order to do so. Geologists, zoologists, and botanists combined to discuss the debatable subject of the lost continent of Gondwanaland. A large part of the zoological and botanical programmes had a definitely South African bias, and both sections benefited by exhibits and demonstrations arranged for the instruction of the visitors. The discussion organised by the Sections of Zoology, Botany, and Physiology on the

Nature of Life was opened by our most distinguished South African member, General Smuts. The Section of Geography, under the presidency of the director-general of the Ordnance Survey, Brigadier Jack, devoted an important part of its programme to the progress of surveying and cartography in South Africa; and it studied a whole series of aspects of human environment, such as the effects of relief of the land upon settlement, economic development under desert conditions, water-supply, soils, and so forth. It also joined the Section of Education in discussing the teaching of geography, with special reference to South African schools and universities. The Economic and Anthropological Sections united to consider economic competition between advanced and backward peoples, and the first covered a wide field of South African economic problems. The Engineering Section dealt appropriately with refrigeration, road and rail transport, town planning, irrigation and mining machinery.

The Anthropological Section, it need scarcely be said, was in its element: chief among many features of topical interest, it received Miss Caton-Thompson's report upon her excavations at Zimbabwe and other sites in Southern Rhodesia, conducted at the instance of the Association, and confirming the medieval origin of the buildings in the face of romantic ideas as to their much greater age. This important investigation, carried out with the generous help of the Rhodes Trustees, was in the nature of a legacy from the meeting in 1905. For it was then that Dr. Randall MacIver made the famous investigation which did not satisfy everyone as to the origin of Zimbabwe, but has now been amply confirmed by Miss Caton-Thompson.

The physiologists and engineers jointly considered problems connected with the ventilation of deep mines on the Rand and elsewhere. The psychologists contributed their results associated with some of the population problems of South Africa. The Educational Section devoted itself almost wholly to South African topics; and lastly the Agricultural Section had the unique opportunity of meeting jointly, in Pretoria, with the Pan-African Agricultural and Veterinary Congress.

To this short summary of the special South African interests of the various sections of the Association it need only be added that visiting members gave public lectures freely, not only in Cape Town and Johannesburg, but, so far as it was possible to comply with invitations, wherever else in South Africa and in Kenya they were asked for—and they were asked for with a gratifying freedom. Important public debates upon Science and Industry were arranged in Cape Town and Johannesburg. And lastly (though in fact they took the leading places) we had the presidential addresses by Dr. Jan Hofmeyr for the South African and by Sir Thomas Holland for the British Association. In the one, Dr. Hofmeyr brilliantly summarised the scientific interests and appeals of the South African continent. In the other, Sir Thomas Holland set forth under the title of the "International Relationships of Minerals," a new and important view of the world-responsibilities of nations gifted with territories rich in economic minerals. He has since, and quite recently, elaborated the same theme before this Society.

These two communications, each in its own appropriate direction, sufficed of themselves to focus the attention of the educated world upon the South African meeting, and invited a lasting attention to its lessons and its meaning.

The Association is now, and will be for some time, pursuing action in various directions to which the recent South African meeting, like its predecessors, has pointed. And we hear with satisfaction of important work done or initiated by individual members, enabled thereto by the opportunity of the visit. Some of the astronomers of the party, for instance, were able to lay plans for strengthening the position of South Africa as the astronomical metropolis of the southern hemisphere. Some of our botanists were able to carry out reconnaissance work in the remoter territories of Northern Rhodesia and elsewhere, where field work is almost untouched. In the department of prehistoric archæology the same thing happened. We hear, too, how in Kenya one distinguished visitor was promptly annexed by the administration to serve in the chair of an important agricultural commission.

In the attempt to survey the work of the British Association in its relation to the Empire, we have ranged pretty widely for our examples—from the Indian tribes of North-western Canada, let us say, to the solar observatory in Australia, and from that to the ruins of Zimbabwe in South Africa. We have indeed collected a mixed bag, and it cannot be pretended that the mixture makes for coherence in a short paper. But it is precisely the characteristics of the mixed bag which makes this aspect of the Association's work unique. There are other scientific organisations, it is true, which carry out meetings overseas not infrequently, but they are all specialised to one department of science or another. And though the French Association for the Advancement of the Sciences occasionally crosses the Mediterranean Sea, and the American Association is sometimes welcomed on the Canadian side of the international boundary, those other associations for the advancement of science which have paid us the compliment of adapting our title do not, as a whole, enjoy our opportunities.

Therefore, with the diffidence which appears in these days to be inherent in any discussion of imperial topics, it seems proper to claim that the British Association has an imperial mission even beyond the immediate confines of science. One of us to whom it fell recently in South Africa to broadcast a speech of farewell ventured to use these words: "Many of us . . . have viewed with sympathetic concern the problems of political economy which still beset a Union born of disunion, and not yet wholly escaped from the perils of birth. . . . May not we, viewing all problems from the common ground and the high ground of Science, express our belief that escape can and will be found? . . . In the development of this great country, Science must be used. You are using it: use it ever more fully, and in that pursuit and use of knowledge which is Science let us achieve community of thought and action."

That was perhaps no more than the expression of a pious hope—a phrase which implies much the same sort of compliment as to say, that a man means well. But

the hope was sincere, and the words did mean well, and inherent in them there was intended to be an implication of what I have called the Association's imperial mission. At least they were no more immodest than the claim of Playfair when, as President of the Association shortly after that first meeting in Montreal, he said that it "marked a distinct epoch in the history of civilisation." And even that we ought not yet to deny.

This paper has attempted to summarise by example the benefits which accrue from meetings of the Association overseas; and they are large. In the category of them, that of "promoting intercourse" was at the outset given a high place. But from the category is there not one benefit missing? The Dominions are instinct with hospitality. The British Association takes full advantage of that instinct to promote the intercourse which is its object. Adequately to reciprocate the hospitality it receives is not within its power. That this power should be acquired is as yet a dream; and if this paper has led its author (to say nothing of its audience) into dreamland, it is time that it should cease.

DISCUSSION

DR. C. W. KIMMINS, M.A., said that he had been to two of the meetings of the Association in Canada, two meetings in South Africa, and one in Australia, and so, in starting to speak, there was a danger that one might become too reminiscent, owing to the number of pleasant memories which flocked up.

One of the points which had not been very fully dealt with was the enormous amount of preliminary work which had to be carried out before a meeting, preparations which rendered the meetings themselves so valuable. For instance, last year he was President of the Education Section, and Professor Clarke, who was the Professor of Education in Cape Town, came over and spent a fortnight with them in London when the programme was being arranged. That made all the difference in the world. They found out what was most needed in South Africa in connection with educational problems, and it was definitely arranged for the Association to meet in Cape Town and devote a whole day to local matters, and the same arrangement was made in regard to Johannesburg, and the Association secured the finest people available to deal with those problems. The papers on native education which were read in Johannesburg were some of the finest contributions on the subject which he had ever listened to. And it was also helpful for the people resident there to come and hear what their own experts were saying on the various problems. It was likewise of enormous advantage to people over here to travel to the different parts of the Empire; that in itself was an education. Everywhere members went the people were delighted to see them, to see in the flesh the experts with whose written works they were familiar. His own experiences in going through the schools at Kenya, he had felt, were of extraordinary interest. The visits were of very great value to all concerned.

MR. J. WILSON thanked Mr. Howarth very cordially for his excellent paper. So useful did he feel it to be that he hoped the reader could be persuaded to deliver it, with the slides which had been shown on this occasion, in some of the other big centres of population, such as Glasgow, Liverpool, Manchester, as many of the British Association's members lived in those districts. Apparently the interest in

science was increasing everywhere, and the opportunities of joining the British Association at the Annual meetings did not seem to be as well known as they ought to be. He personally had greatly enjoyed the two trips he took. When Cook's agency started their organisation he imagined the idea was borrowed from the Association, though Mr. Cook had never got anywhere near the British Association method. Wherever visits were planned, there were always experts to conduct the party, so that they obtained the best available information. He also wished to mention the infectious nature of the interest of those following one department of science to those in other departments: it was manifested in the Canadian visit, where everyone seemed to be collectors of everything, and then, on the return journey, a host of things which members did not wish to be cumbered with any longer were cast out of the carriage window. A further remarkable thing was the tremendous amount of voluntary work done in connection with the meetings by secretaries and recorders of sections, for example, and this excellent spirit was largely due to the Secretary, Mr. Howarth.

DR. ARTHUR HAYDON, M.D., asked what arrangements were made in regard to the cost of the journeys on the overseas visits: what class of people would be entitled to a reduction of fares. Did it apply to secretaries and presidents of sections, or to all who wanted to attend the meetings?

MR. HOWARTH replied that the practice in regard to reduced fares differed at the various meetings. At some it was possible to extend the same facilities to everybody, except in the matter of grants made, and these were made only to selected persons. Usually it was not necessary to debar any member in respect of overseas meetings if he chose to pay such fares as were operative in connection with the particular meeting. Only once had it been necessary to make up a party on the process of selection.

THE CHAIRMAN said that when he met Mr. Howarth in the tea room before the lecture, that gentleman expressed the opinion that his lecture would be a dull one. Having read it beforehand, the speaker had not formed that opinion, and he was sure the audience, having heard it, did not think so either.

The British Association was a very interesting institution indeed. Its beginnings were made nearly a century ago in a small way and under considerable difficulties. At first it was not very warmly looked upon in scientific circles, but it did not take long to make good. The holding of the first meeting in Canada in 1884 was an act of real statesmanship. On such trips the advantages to those who went and to the people visited were immense, as had already been well said. Only those who had lived overseas for many years could appreciate the limitations to which distant residents were subject, especially in the matter of scientific work. The advantage of being able to meet those working in one's own domain, and especially experts, could not be too highly assessed. It was a source of pride that the Association was not only an institution of the younger men in science, but the leaders of science had, almost from the beginning, backed it up, and they had invariably attended the meetings in large numbers.

The next landmark in its history would be the Centenary meeting next year. The Association was fortunate to have so skilled an officer as Mr. Howarth for its Secretary, to make arrangements for such an important meeting. He asked the audience to pass a vote of thanks to Mr. Howarth for his most interesting address.

The vote of thanks having been passed unanimously, *

MR. HOWARTH, in reply, thanked very heartily those who had spoken for their generous words. To those gentlemen who did so much voluntary work in connection with the meetings he owed much of pleasure, friendship and gratitude. He sometimes wished he could amply illustrate all that the British Association meant to us as a people in the way of the mental well-being, education and enjoyment of all, of which Dr. Kimmins gave just a glimpse.

Without saying whether it was true or not, he would like to relate a story. A most distinguished member of the Association, on his way to South Africa this year, reached the latitude of the Southern Tropic without being aware that he was not in the Pacific Ocean. And was it, he wondered, the same or another member who, on being invited to inspect a school of whales in about the same latitude, misunderstood the invitation and asked "What part of the coast of Wales?"

CORRESPONDENCE.

THE WALL OF VICTORIA STATION

I have long felt that the great wall of Victoria Station in Buckingham Palace Road was one of the most comforting pieces of architecture in London, and my gratitude has often gone out in silence to the Southern Railway when passing there; but lately I have been distressed to see that its noble surface has been rudely broken by the intrusion of posters. Well! I am the last man to object to posters! Indeed, I regard the poster as the only form of mural decoration in this country that shows any signs of life; but the wall of Victoria Station being almost perfect and complete in itself, has no need of such decoration. Perhaps the General Manager of the Southern Railway may not be aware of this assault upon his wall, and if one may respectfully call his attention to the matter, he may see his way to redirect the energies of his Advertising Agent.

J. KERR-LAWSON.

EXHIBITION OF ARTS AND CRAFTS

EXHIBITION OF THE L.C.C. CENTRAL SCHOOL OF ARTS AND CRAFTS. Till June 25th.
Southampton Row, W.C.1.

Visitors to the present exhibition are sure to be agreeably impressed. There is a large variety of craftwork on view, all at least on a high technical level, and little of it less than sound from the point of view of design. A certain deficiency of inspiration does not seem to matter; that may come later, and good taste is a good thing in itself.

The infection of care and common-sense has not missed the very young. It has spread even to the boy exhibitors of under sixteen, whose work in gold and silver shows no symptom of that sympathetic complaint: immaturity. The older craftsmen are not unworthy of their juniors; one student shows a copy of the funeral barge of Tutankhamen in ivory, gold and silver, which, if neither original nor quite essentially aesthetic, displays an amazing mastery of a whole series of techniques.

The textile designs, conceived in the spirit of the age, are satisfying, and harmonious with neighbouring exhibits of furniture and pottery as if made purposely to accompany them. It would be hard in this department to excel, or even seriously compete with,

certain established English designers, nevertheless some of the patterns shown are not only competent but fresh. A striking embroidered curtain in the inner room is almost very good.

The school is fostering several potters of outstanding ability. The useful wares are nearly always attractive, and though we may not feel that the decorative groups are altogether valuable, of their cunning workmanship there can be no doubt.

Coming to the section of book-production, we must feel sorry for the poor collectors, doomed to barter in vain for a copy of the magnificent "Stowe's Survey" that the School is printing. This superb edition is not destined for private individuals at all, only for foreign potentates, and the like, officially visiting the City of London. Less magnificent but not less delightful examples of the skill of the same craftsmen will, however, be accessible. The illustrator of G. de Nerval's "Aurelia" deserves special mention. (This translation, however, was not made for the Central School).

Painting and sculpture are not represented as worthily as the crafts, but even so the work shown is interesting, and in certain cases promising. There is not much furniture; what there is, is simple and good.

RADCLIFFE OBSERVATORY

This Journal has called attention to the importance of preserving the Radcliffe Observatory, and Mrs. Esdaile's interesting article on the subject of Bacon's work thereon appeared in a recent number. Sir William Morris, the great Oxford industrialist, has done a real service to Art and Industry, by handing over the grounds to the adjoining Radcliffe Infirmary, and placing the building at the disposal of the University Medical School.

Professor G. Dreyer described the gift as one that was unique in the history of the medical school. The result, he said, would be to make possible a much greater degree of co-operation between the medical students of the University and the Radcliffe Infirmary. He hoped that it might be the germ of a future development under which medical students would be able to complete their professional education in Oxford. "This magnificent gift, both to the city and to the University," he declared, "will provide room for the much-needed extension of the infirmary, and will assist in the development of post-graduate teaching."

NOTES ON BOOKS

MINERALOGY: AN INTRODUCTION TO THE SCIENTIFIC STUDY OF MINERALS. By Sir Henry A. Miers, M.A., D.Sc., F.R.S. Second Edition, revised by Professor H. L. Bowman, M.A., D.Sc. London: Macmillan and Co., Ltd. 30s.

When, in 1902, Professor Miers published the first edition of "Mineralogy," he succeeded in making available to students, in a convenient sized volume, the best and most reliable English text-book on the essential characters of minerals, and for a number of years it remained a standard work on this important part of the subject. The author made no attempt at a systematic account of the origin,

the mode of occurrence, and geological distribution of minerals, not because he did not fully recognise their outstanding importance, but in order to fulfil his object of keeping the volume within reasonable limits.

Professor Bowman, the well-known mineralogist, wisely decided in this second edition to retain the original plan, and a great deal of the original text of the first edition, making such changes and additions as were necessary to meet the great advances in the subject during the last two decades. This has involved the inclusion of a large number of new figures, the redrawing of old ones, careful revision of many parts of the text, considerable extension of the section on crystal structure, and the addition of a most valuable chapter on X-ray analysis.

The most radical change in the new edition is the introduction of the idea of wave-surface to explain the optical properties of crystals, with the object of giving the student a clearer concept of the passage of light through crystals than could be obtained by confining the explanation to the ellipsoid. Professor Bowman has succeeded admirably in presenting this elusive subject clearly and concisely.

It is difficult to understand the necessity for dividing Part I of the volume into Books I to V, each book commencing with a first chapter, and of dividing Part II into sections and not chapters. The result is that this one volume contains four chapters numbered one, an unnumbered chapter in Book III, and 27 sections in Part II. Professor Bowman has followed in the second edition the divisions and sub-divisions of the first edition, but the general arrangement of the subject matter has been so well accomplished that the ordinary method of division into chapters numbered in sequence would appear to have been sufficient, and more convenient for reference. It is hardly necessary, for example, to separate the general physical and chemical properties of minerals (Book II) from the relations between these two properties (Book III) by any division other than chapters.

Part I deals with the "Properties of Minerals," the first four chapters being devoted to a description of the crystalline form of minerals, the regular conjunction of crystals, vicinal faces, and the measurement of crystals with contact and reflecting goniometers. Chapter V treats some of the chief physical properties characteristic of crystals, and Chapters VI to VIII the optical properties and their determination. Books II and III contain a detailed account of the general physical and chemical properties, and their relations to one another, in minerals. The first chapter in Book IV discusses the theory of crystal structure, and by means of clear diagrams the author presents his subject in a delightfully clear and interesting manner.

Chapter II, Book IV, deserves a paragraph to itself. The investigation of crystal structure by means of X-rays has placed a new and valuable weapon in the hands of mineralogists by means of which much new and direct evidence has been obtained to correct and supplement previous indirect evidence on which theories were based. In this extremely valuable chapter, with the aid of a score of figures, Professor Bowman describes the nature of the rays, their interference, the X-ray spectrometer due to the researches of Sir W. Bragg, its application to the analysis of crystal structure and in particular to crystals of rock salt and sylvite, sphalerite and diamond, fluorite, calcite, and cuprite, ending the chapter with a brief and clear account of the Lane Diffraction Pattern.

Book V, Chapter I, entitled "Descriptive Terms," gives an account of the characters of minerals in relation to their morphology, structure, cohesion, optical properties, and their magnetic and electric characters. The second chapter explains how minerals can be determined by physical and chemical examination, but a serious student of determinative mineralogy would require to supplement the information given in this chapter from a text-book on this important branch of mineralogy.

Part II, consisting of 27 sections, contains descriptions of the more important mineral species arranged according to their chemical composition. Then follow very useful reference tables giving a list of the principal minerals with their composition, the reactions to dry and wet tests, lists of minerals arranged according to their mean refractive index, their birefringence and optical sign, and their specific gravity, with a comprehensive index for reference.

One of the many pleasant features of this volume of 658 pages are the 729 figures, most clearly reproduced and so arranged as to obviate the irritating necessity of turning pages when reading their descriptions. This excellent work can be confidently recommended as the best text-book published in this country on the essential characters of minerals. It remains to add that the well-known publishers have definitely maintained the high standard that one has learnt to expect in their important publications.

WILLIAM R. JONES.

THE ELEMENTS OF DOMESTIC DESIGN. By Arthur J. Penty. London: The Architectural Press. 15s.

This is an interesting and suggestive book. Mr. Penty has ideas for brick, stone and wood which he illustrates and explains with great care.

He is no friend of the Classical tradition, and is hardly fair when he says: "... nevertheless much delightful work was done in the early days of the Renaissance, but the quality which we admire we feel to be due to the survival of the traditions of the native and primitive culture which remoulded and transformed Classical forms according to its genius. . ."

Nor is appreciation of Palladio's "big scale" the same thing as that worship of big things which, according to Mr. Chesterton, is the mark of a small mind. It was the correct, not the big scale which the Classical builders sought; but Mr. Penty tries to have it both ways, and criticises the Italians for their insistence on Roman precedents. They did so, up to a point, because they believed these were based on the right principles, not because they were megalomaniacs.

The primitive has, at any rate, been a source of inspiration to Mr. Penty, and it is more important to *gagner les batailles* than to *savoir raisonner sur la guerre* to the satisfaction of those with tastes different from one's own.

MEETINGS OF OTHER SOCIETIES DURING THE ENSUING WEEK.

- MONDAY, JUNE 16. Geographical Society, at the Æolian Hall, New Bond Street, W. 8.30 p.m.
University of London, at the London School of Economics, Houghton Street, W.C. 6 p.m. Prof. C. Burt, "The Measurement of Mental Capacities." (Lecture III.)
Victoria Institute, at the Central Hall, Westminster, S.W. 4.30 p.m. Sir Ambrose Fleming, Presidential Annual Address, "Creation and Modern Cosmogony."
- TUESDAY, JUNE 17. Statistical Society, at the ROYAL SOCIETY OF ARTS, Adelphi, W.C. 5.15 p.m. Mr. A. W. Flux, "Our Food Supply before and after the War."
- WEDNESDAY, JUNE 18. British Commonwealth League, at the ROYAL SOCIETY OF ARTS, Adelphi, W.C. 10 a.m., 2 p.m., and 8 p.m. Conference on Women, Power and Policy in relation to the Imperial Conference.
- Meteorological Society, 49 Cromwell Road, S.W. 5 p.m.
(1) Dr. C. E. P. Brooks and Mr. S. T. A. Mirrieles, "Irregularities in the Annual Variation of Temperature in London." (2) Dr. C. E. P. Brooks, "The Climate of the First Half of the Eighteenth Century."
University of London, at King's College, Strand, W.C. 5.30 p.m. Prof. C. H. Turner, "The Idea of the Church and the Sacraments. Lecture IV—Confirmation."
- THURSDAY, JUNE 19. Asiatic Society, 74 Grosvenor Street, W. 4.30 p.m. Prof. Dr. D. S. Margoliouth, "Sidelights on Islamic History and Customs in the Fourth Century A.H."
British Commonwealth League, at the ROYAL SOCIETY OF ARTS, Adelphi, W.C. 10 a.m. and 2 p.m. Conference on Women, Power and Policy in relation to the Imperial Conference.
Chemical Society, Burlington House, W. 8 p.m.
East India Association, at Caxton Hall, Westminster, S.W. 4.30 p.m. Prof. Rushbrook Williams, C.B.E., "Indian Unrest and American Opinion."
- FRIDAY, JUNE 20. London Society at the ROYAL SOCIETY OF ARTS, Adelphi, W.C. 5 p.m. Mr. T. Adams, "Landscape Road Designs." (Joint Meeting with the Roads Beautifying Association.)

JOURNAL OF THE ROYAL SOCIETY OF ARTS.

No. 4048

FRIDAY, JUNE 20th, 1930.

VOL. LXXVIII

All communications for the Society should be addressed to the Secretary, John Street, Adelphi, W.C.2.

FINANCIAL STATEMENT FOR 1929.

The following statement is published in this week's *Journal* in accordance with Sec. 25 of the Society's Bye-laws:—

INCOME AND EXPENDITURE ACCOUNT

January 1st to December 31st, 1929.

Dr.	£	s.	d.	£	s.	d.	Cr.	£	s.	d.	£	s.	d.
To <i>Journal</i> , including Printing Publishing and Adver- tisements.....	3,523	10	10				By Subscriptions.....	5,934	7	0			
„ Library and Bookbinding	66	17	11				„ Life Compositions.....	687	7	0			
„ Medals:—											6,621	14	0
Albert.....	21	8	6				„ Interest and Dividends on Society's Investments..	346	16	11			
Society's ..	32	3	6				„ Ground Rents.....	372	10	0			
				53	12	0	„ Interest, Dividends, and Ground Rents from Trust Funds for General Pur- poses.....	496	5	6			
„ Cantor Lectures.....	115	3	0				Do, from Building and En- dowment Funds.....	22	7	5			
„ Expenses of Examinations				3,759	3	9					1,237	19	10
„ House:—				14,363	16	9	„ Sales, etc.—						
Rates and Taxes.....	359	4	7				<i>Journal</i>	241	1	0			
Insurance, Gas, Coal, Expenses and Charges incidental to Meetings	733	7	1				Do. Advertisements	687	10	0			
Repairs.....	226	13	11				Cantor Lectures.....	27	8	0			
				1,319	5	7					955	19	0
„ Office Expenses:—							„ Examination Fees and Advertisements in and Sale of Examination Papers..	16,210	4	0			
Salaries, Wages, and Pensions.....	3,937	2	7				„ Charges for Expenses for the use of Meeting Room.....	368	5	0			
Stationery and Office Printing.....	514	13	7				„ Rent of Cellars.....	75	0	0			
Postages, Parcels and Messengers' Fares..	300	12	2				„ Industrial Art Competition (Entrance Fees, etc.....	494	7	2			
				4,752	8	4	„ Balance, being Excess of Expenditure over Income transferred to Capital Account (see Balance Sheet).....	16	9	1			
„ Committees:—													
General Expenses.....	40	1	2										
„ Industrial Art Competition (Expenses)...	1,055	6	10										
„ Interest on Bank Overdraft.....	139	9	8										
Superannuation Fund.....	550	6	0										
				£25,979	18	1					£25,979	18	1

TRUST INCOME AND EXPENDITURE ACCOUNTS.

Dr

Cr.

						Trust Accumulations, Dec. 31st, 1929.	
		£	s. d.	£	s. d.	£	s. d.
TO SHAW TRUST—							
Balance, 1st Jan., 1929	32	4	2				
Interest	4	13	6				
	36	17	8				
Paid Sir T. M. Legge for Lectures (including Printing)	41	17	6				
Balance due to the Society				4	19	10	
Balance forward				1,157	3	3	
JOHN STOCK TRUST—							
By Balance, January 1st, 1929 ..	53	7	5				
„ Interest on Investments	3	10	2				
Less Prize for Industrial Design	56	17	7				
	50	0	0			6	17
NORTH LONDON EXHIBITION TRUST—							
„ Balance, January 1st, 1929 ..	34	5	10				
„ Interest on Investments	6	14	10			41	0
DR. ALDRED TRUST—							
„ Balance, January 1st, 1929 ..	80	16	1				
„ Interest on Investments	7	14	5				
	88	10	6				
Less Paid Sir E. D. Ross for Lectures (including printing) ..	51	17	6			36	13
THOMAS HOWARD TRUST—							
„ Balance, January 1st, 1929 ..	97	17	4				
„ Interest on Investments	10	19	8			117	17
MULREADY TRUST—							
„ Balance, January 1st, 1929 ..	41	6	5				
„ Interest on Investments	5	11	0				
	46	17	5				
Less Prize for Industrial Design	20	0	0			26	17
DR. SWINEY TRUST—							
„ Balance, January 1st, 1929 ..	100	0	0				
„ Ground Rents (Income from) ..	180	0	0				
	280	0	0				
Less Prize to Professor S. Smith	100	0	0				
„ Transfer to Society's Income and Expen- diture a/c	140	0	0			40	0
FRANCIS COBB TRUST—							
„ Balance, January 1st, 1929 ..	62	18	11				
„ Interest on Investments	8	18	10			71	17
LE NEVE FOSTER PRIZE TRUST—							
„ Balance, January 1st, 1929 ..	30	5	10				
„ Interest on Investments	8	0	2			38	6
FOTHERGILL TRUST—							
„ Balance, January 1st, 1929 ..	44	6	4				
„ Interest on Investments	13	12	5			57	18
CANTOR TRUST—							
„ Interest on Investments	137	2	10				
„ Ground Rents (Income from) ..	141	0	0				
	278	2	10				
Less Transfer to Society's Income & Expenditure a/c ..	278	2	10				
DAVIS TRUST—							
„ Interest on Investments	78	2	8				
Less Transfer to Society's Income & Expenditure a/c ..	78	2	8				
SIR GEORGE BIRDWOOD MEMORIAL TRUST—							
„ Interest on Investments	36	15	0				
Less cost of Captain P. Johnston-Saint's Lecture (including Printing)	36	15	0				
RUSSIAN EMBASSY PRIZE TRUST—							
„ Balance, January 1st, 1929 ..	30	0	0				
„ Interest on Investments	5	0	0			35	0
DR. MANN TRUST—							
„ Balance, January 1st, 1929 ..	56	10	3				
„ Interest on Investments	51	8	6				
	107	18	9				
Less Paid for Lectures	42	19	0			64	19
Carried forward						£537	7
							11

Carried forward.....£1,162 3 1

Carried forward£537 7 11

TRUST INCOME AND EXPENDITURE ACCOUNTS—continued.

	£	s.	d.
Brought forward.....	1,162	3	1
<hr/>			
	£1,162	3	1

	£	s.	d.	£	s.	d.
Brought forward				537	7	11
OWEN JONES MEMORIAL TRUST—						
By Interest on Investments	15	13	4			
Less Prizes awarded	15	13	4			
THOMAS GRAY TRUST—						
„ Balance, January 1st, 1929 ..	519	16	7			
„ Interest on Investments	316	13	6			
	836	10	1			
Less Pd. for Prizes & Essays	240	10	0	596	0	1
TRUEMAN WOOD LECTURE TRUST—						
„ Interest on Investments	32	10	10			
Less cost of Sir J. A. Ewing's Lecture (including Printing)	32	10	10			
ART CONGRESS STUDENTSHIP						
„ Balance due the Society	37	1	0			
Interest on Investments	65	16	10			
				28	15	1
				£1,162	3	1

1930--Jan. 1. By Balance brought forward £1,157 3 3

BALANCE SHEET, December 31st, 1929.

	£	s.	d.	£	s.	d.
Capital Account—						
As on January 1st, 1920	75,273	13	11			
Donations <i>re</i> Building Fund	251	17	0			
	75,525	10	11			
<i>Less</i> Income and Expenditure Account Balance	16	9	1			
				75,509	1	10
Sundry Creditors				1,622	12	7
Bank Overdraft				5,047	9	4
Industrial Art Fund (Donations received and not yet expended)						
				554	11	8
Trust Funds—						
Capital Account	25,410	6	0			
Accumulations under Trust Income and Expenditure Account	1,157	3	3			
Sundry Creditors	23	15	0			
				26,591	4	3
				£109,324	19	8

	£	<i>s.</i>	<i>d.</i>	£	<i>s.</i>	<i>d.</i>
Freehold Premises, 18 and 19 John Street, as on December 31st, 1923				*50,392	16	7
Books, Pictures, etc.				10,000	0	0
Investments (see schedule) ..				17,481	8	5
Subscriptions outstanding ..				2,002	8	0
Sundry Debtors and Ground Rents outstanding				1,547	0	8
Paid on account of 1930 Examinations				2,400	0	0
 Trust Funds— Investments	25,410	6	0			
Ground Rents, etc.		90	0			
				25,500	6	0
				£109,324	19	8

PRESERVATION OF ANCIENT COTTAGES FUND.

	£	s.	d.
Donations received to December 31st, 1928	0,796	14	1
Do. received in 1929	3,384	4	3
Interest	143	17	6
Rents	137	13	10
	£10,462	9	8

	£	s.	d.
£3,541 18 3 ¼ Consolidated Stock ..	3,000	0	0
Hampstead Garden Suburb Debenture Stock ..		55	0
Amount paid to preserve Cottages at Worthing ..		60	0
Paid on Account of:—			
West Wycombe ..	5,474	14	10
Arlington Row ..	1,187	7	3
Expenses, printing, postage, etc. ..	488	9	5
Cash at Bank ..	196	18	2
	£10,162	9	8

We have audited the above Accounts and Balance Sheet for 1929 with the books, accounts and vouchers relating thereto, and certify them as being in accordance therewith. We have verified the Bank Balances and investments.

KNOX, CROPPER & CO.,
Chartered Accountants.

Spencer House, South Place, E.C. 2.
30th April, 1930.

* Towards this amount £43,758 10s. 2d. has been received in subscriptions from Fellows of the Society and others, and the excess of income over expenditure for the years 1922-28 amounted to £2,904 14s. 11d. There is therefore still a deficit of £3,729 11s. 6d. on the Building Fund, and the Council earnestly appeal to Fellows to assist them in clearing it off.

SCHEDULE OF THE SOCIETY'S INVESTMENTS.

		Standing in the Books at a Value of	
Ground Rents (amount invested)		£10,496	2 9
£217 0 0	Great Indian Peninsula Railway 4 per cent. Guaranteed Debenture Stock	157	0 0
£500 0 0	New South Wales 4 per cent. Stock	445	0 0
£500 0 0	Canada 3½ per cent. Stock	430	0 0
£100 0 0	Queensland 4 per cent. Stock	97	0 0
£530 10 1	New South Wales 5 per cent. Stock	514	11 0
£500 0 0	Natal 4 per cent. Stock	445	0 0
£321 15 9	Metropolitan Water Board "B" Stock	209	3 0
£6 0 0	New River Company Shares	6	0 0
£3,408 14 6	India 3½ per cent. Stock	2,181	11 8
£500 0 0	South Australia 4 per cent. Stock	500	0 0
£2,000 0 0	War Loan 5 per cent.	2,000	0 0
		£17,481	8 5

The Market value of the above investments on December 31, 1929, was £17,281 0 0

TRUST FUNDS INVESTMENTS SCHEDULE.

		Stock held.	Value at date of Bequest or Transfer.	Value on Dec. 31, 1929
Allred Davies Bequest	£1,953 0 0	Great Indian Peninsula Railway 4 per cent. Guaranteed Debenture Stock	£1,800 0 0	£1,347 10 0
Dr. Swiney's Bequest	4,477 10 0	Ground-rents (amount expended)	4,477 10 0	4,477 10 0
Dr. Cantor's Bequest	2,695 11 3	Do. do. do.	2,695 11 3	2,695 11 3
Mulready Trust	111 0 9	5 per cent. War Loan	109 10 1	111 0 9
Howard Trust	571 0 0	Metropolitan Railway 3½ per cent. Stock	510 9 5	348 6 0
Owen Jones Trust	522 3 2	India 3 per cent. Stock	423 0 0	268 18 2
Dr. Cantor's Bequest	3,273 16 6	Do. do.	2,573 10 0	1,686 0 0
	648 19 7	Bombay and Baroda Railway Guaranteed 3 per cent. Stock		639 3 4
J. Murray and others, Building Fund	20 16 4	India 3½ per cent. Stock	20 10 0	12 16 0
	38 11 0	5 per cent. War Loan	54 18 0	38 11 0
Francis Cobb Trust	255 14 1	New South Wales 3½ per cent. Stock, 1930 50.	250 0 0	178 19 10
Le Neve Foster Trust	140 3 1	3½ per cent. Conversion Loan	100 0 0	104 0 0
	42 2 1	5 do. War Loan	40 0 0	42 2 1
John Stock Trust	70 4 0	5 do. do.	100 0 0	70 4 0
Shaw Trust	93 12 0	5 do. do.	129 6 8	93 12 0
North London Exhibition Trust	134 17 0	5 do. do.	184 15 0	134 17 0
Fothergill Trust	272 7 6	5 do. do.	374 0 0	272 7 6
Aldred Trust	154 8 0	5 do. do.	210 17 6	154 8 0
Endowment Fund	394 7 0	5 do. do.	525 2 3	394 7 0
"Trueman Wood" Lecture Endowment Fund	929 15 8	3½ do. Conversion Loan	654 18 0	690 7 0
Sir George Birdwood Memorial Fund	734 19 9	5 do. War Loan	674 0 0	734 19 9
Russian Embassy Prize	100 0 0	5 do. do.	91 9 3	100 0 0
Mann Trust	1,028 9 2	5 do. do.	900 0 0	1,028 9 2
Thomas Gray Memorial Trust	9,047 18 9	3½ do. Conversion Loan	7,000 0 0	6,718 0 0
	1,000 0 0	Canada 4 per cent. Stock	1,000 0 0	880 0 0
Art Congress Studentship	112 0 0	Bengal-Nagpur Railway 4 per cent. Debenture Stock	112 0 0	78 8 0
	391 9 6	5 per cent. War Loan	398 18 7	391 9 6
			£25,410 6 0	£23,691 17 4

NEWS OF THE WEEK

"Our present educational system, while presenting opportunities to the industrious, makes far easier the life of the unambitious and the indolent."

Lord Leverhulme.

The Potter.—There is a very interesting article by Mr. Arthur Trethowan (Messrs. Heal's) in the *Trades Furnishing Organiser*, from which we quote the following :—

'The advance of modern industry makes it possible for us to form what we will, although clay still retains its tendency to act according to its nature when pressed (literally) into misshapen service. All honour is due to individual artists who have studied the art and craft of the potter, and have helped to re-create the desire to possess pottery for its own sake, but my claim is that this work should be done within the industry. Its influence would be greater and more far-reaching. How many times have we pleaded for the linking up with industry those artists who are prepared to work in the medium at their disposal, and thus let the industry within its own borders provide the beautiful pot ?

It is possible to point to many an enterprise in this and other countries that have adopted this plan with success.

Criticism that is damaging is all too easy, and there are many sincere folk who condemn, say, the British Industries Fair in its entirety, and yet in its very midst are to be found men who are accomplishing exactly what I am pleading for. I purposely refrain from mentioning names, because it is possible to read between the lines and recall them.

Whereas the majority of the people who love pottery as pottery, would not deign even so much as to look upon the products that are to be seen at the British Industries Fair, there are some people with a discriminating sense of good taste who are capable of making a choice of wares to be housed in museums and art galleries.

Such potters may be few, but their faith is worth imbibing and their work worthy of inculcation.

In Sweden, Denmark, Germany and France such work as I have indicated goes on. In Germany the result of the quality corner ideal, makes the exhibition during the Leipzig Fair possible in the Grassi Museum. I for one believe that if pains were taken carefully to select, such an effort would meet with success in England, and who knows whether, when the next British Industries Fair comes round, we may not find an exhibition of choice wares going on in another place that would defeat the people who say that in England neither the manufacturer nor the distributor nor the public has yet acquired good taste.

Graham Gallery.—PAINTINGS IN WATER COLOUR BY LILIAN HEISCH.—

There is one especial quality in water colour, to which if the artist has it, every road lies open, and that is the gift of putting on clear colour with absolute directness and without re-touching. This is the essence of watercolour painting and can convey a spring flower or the most delicate landscape effects as no other medium can. These sketches are very slight and delicate, sometimes only a few strokes of the brush, a branch dipping over a lake, some exquisite scenes in Italy and

an English bluebell wood, but they have a beauty and a quality all their own and a most refreshing simplicity. When Mrs. Heisch attempts the ordinary, more ambitious type of watercolour, she is not so successful, but in her own particular sphere she has got something very definite to say. This week the pictures are on view at 92 Knightsbridge, S.W.1, from 3 to 5 every afternoon, and we strongly advise anyone interested to visit this delightful exhibition.

The Twenty-One Gallery.—EXHIBITION OF THE SENEFELDER CLUB.—Any exhibition of the work of the Senefelder Club ought to have a special interest for the members of the Royal Society of Arts; in fact, it is most illuminating to see how many great art societies owed their foundation to the efforts of the Society. In 1819 a medal was awarded to Aloys Senefelder, the inventor of lithography. In the year 1818 Senefelder published his "*Lehrbuch der Steindruckerey*," and it was this book that really drew attention to the new art.

The present exhibition of the Senefelder Club at the Twenty-One Gallery is rather uneven. There is some good work, but nothing of outstanding merit, except perhaps one or two by Blampied. "*The Accusation*" and "*In Haste for the Doctor*" (Nos. 37 and 38) by this artist are fine dramatic works with beautiful line effects and great cleverness in the subjugation of detail to the main interest of the picture. Ethel Gabain shows two little impressions which have decided merit and feeling for the medium, and No. 59, "*Requiem*," by Louis Thomson, is full of imagination and would be a fine picture if the central figure was as good as the idea.

Theatres.—THREE GREAT DISEASES.—We may look with grim depression (as is the fashion during the summer theatre slump) upon the future of the drama, and discuss the dearth of talent on the stage, but the outlook cannot be so very bad when there are three actresses in three London theatres giving an entire programme without the aid of scenery or costumes, namely, Ruth Draper, Yvette Guilbert and Angna Enters. Each is a great artist in her own way. Yvette Guilbert is in a class by herself; she is no longer young and her singing voice is sometimes a little hard, but as an artist she is still supreme, and we should advise anyone who has not had the great delight of listening to her to go to the Arts Theatre as soon as possible. Every movement and gesture is a thing of perfection, she can keep an audience interested for five minutes without a word while she bites off an imaginary piece of thread at the end of her sewing; with the wink of her eye she can convey the whole philosophy of love, and with a gesture she can conjure up a scene. Such is real acting.

Books.—"APRIL FOOLS," by Compton Mackenzie. This is a delightful bit of fooling. No one can be so care-free and delightfully irresponsible as Mr. Mackenzie when he has a mind to throw off the serious problems of life. This book concerns the quarrels of two or three people who have been left a property

in a will and are all compelled to live there together What more need be said with such a foundation for sport?

Miss Sheila Kaye Smith gave an excellent criticism of Mr. Compton Mackenzie when she said that he was two distinct personalities, or even sometimes three, as in such bitterly satiric books as "Extraordinary Women," the more serious "Carnival" and often in such April fooling as the present volume. It will be most interesting to see which of these moods holds him longest and if he will return to the more sombre mood after his adventure into farce. Meanwhile this remains a delightful entertainment.

Electrification of Main Line Railways in the London Area.—Mr. Alfred Bossom, F.R.I.B.A., a member of the Council of the Society, makes an interesting suggestion in a letter published in *The Times* on June 3rd. His proposal is that London should do what New York has already done, and electrify all the main railway lines within a certain radius. This would make it possible, Mr. Bossom points out, for "these ugly non-productive gashes to be covered over, built upon, and turned into public thoroughfares. The finest residential avenue in New York has been wholly erected over the tracks of the New York Central Railway." The railway tracks running into London are, in Mr. Bossom's view, some of the most valuable pieces of undeveloped property in the world. "They are capable," he says, "of being turned into sources of revenue that would make the initial cost of electrification and reconstruction a mere flea-bite." Mr. Bossom's suggestion has all the appearance of being just one of those constructive proposals which are so valuable and of which everyone appears so short just now. The scheme would reduce the smoke nuisance, materially ease the housing problem by providing space for new houses and streets, and would also create a large amount of employment for supplying electrical rolling stock, and for boxing in the railway tracks and covering them with building-bearing streets. It is not often in these difficult days that one can kill three birds with one stone. Here there is one each for Mr. J. H. Thomas, the railway companies, and the London County Council.

NOTICE

ANNUAL GENERAL MEETING

The Council hereby give notice that the One-hundred-and-seventy-sixth Annual General Meeting, for the purpose of receiving the Council's Report and the Financial Statement for 1929, for the election of Officers, and to consider the sale of ground rents at Clapton, will be held, in accordance with the Bye-laws, on Wednesday, June 25th, at 4 p.m.

(By Order of the Council),

GEORGE KENNETH MENZIES,

Secretary.

PROCEEDINGS OF THE SOCIETY

TWENTY-FIRST ORDINARY MEETING

WEDNESDAY, MAY 7TH, 1930

MAJOR-GENERAL SIR FABIAN A. G. WARE, K.C.V.O., K.B.E., C.B., C.M.G.,
LL.D., in the Chair

THE CHAIRMAN, in introducing the lecturer, said the subject of the address was "National Parks." Personally, he wanted to know what national parks were. He supposed there was no part of England where, within 20 miles of one's home, there was not still some beautiful private park in which birds, animals, flowers and trees were preserved and which were thrown open to the public enjoyment. But facts had to be faced, and one fact was that during the last 20 years all legislation had been antagonistic to the holding of land to such an extent by private owners. It has been decided by the vast majority of the people of this country that that was not in keeping with the present tendency of democracy, and more and more the land represented by those parks was passing out of the hands of its former owners. All would agree that the doing away with the ownership of land by a few people must be a constructive as well as a destructive policy. At present what was causing many of those who were studying the subject intense anxiety was that, in its results, that policy was very largely destructive. Such land, when it passed out of the ownership of the individual, went over to the speculative builder. One knew what disastrous results were coming over the face of England in that respect. The England that had been handed down to posterity by Turner, Gainsborough and Constable existed no longer. One could talk for a long time on that subject, but it was very closely connected with the subject matter of the lecture that evening, because it was to be hoped that something out of the wreckage could be saved. The stage had been reached when those concerned were looking to the Government to do something in the matter. Whether one agreed with the present Government or not, it had the reputation of being a Government which would do things, and it was to be hoped that in the question of national parks it would do things. In his own county of Gloucestershire Lord Bledisloe had made what appeared to be a very generous offer with regard to the Forest of Dean, namely, to give to the country a certain portion of his own land, on which stood valuable Roman remains, if the Forest of Dean were to be transferred into a national park. One could not understand why such an offer was not immediately accepted. A Committee appointed by the Prime Minister was considering the question, but those who had a good deal of experience of committees and commissions did not always expect them to effect very much. He desired to say how those who were working on the subject under discussion valued the opportunity which the Royal Society of Arts gave for the discussion of the matter. He still had faith in such discussions, although he recalled the last occasion on which he had been in the Chair of the Society. That had been 25 years ago at an extremely interesting lecture on Town Planning. Crossing the Atlantic two years ago he had met the lecturer on board ship, and had asked him if everything was going well with Town Planning. The gentleman had replied that it was going very well, because he now occupied a very prominent position in connection with the town planning which was being carried out in the surroundings of New York; that was to say, he was doing his work in America. He (the Chairman) hoped that that would not be Mr. Ratcliffe's fate!

The following lecture was then delivered :—

NATIONAL PARKS

BY S. K. RATCLIFFE

I have no claim to authoritative knowledge of the subject, but it has happened that I was one of the first journalists in England to call public attention to the need, not only of national parks, but also of a national parks policy, that is, a thought-out policy relating to the preservation of the British heritage of wild country. The need becomes greater with every year, because of great changes in the system of land tenure, our rapid road development and the unchecked expansion of great cities and industrial towns. The reservation of fine country to the public use in perpetuity cannot be left to chance.

National parks are American in origin. They began in 1872 with the setting apart as a national domain under the Federal Government, of the great Yellowstone region in Wyoming, a tract of magnificent mountain country, 3,350 sq. miles in extent (almost one-and-a-half times the size of Devonshire), with, as its chief feature, the famous 100 geysers. When the Yellowstone was reserved, it was, of course, extremely remote. The transcontinental railroads were in their infancy, and it was not until many years later, when the motor era had begun, and the American people were getting the habit of western travel, that the U.S. Government entered upon the policy of multiplying and extending the national parks. The Yosemite Valley, in California, was marked out in 1900, and thereafter came the Glacier and Rainier Parks, the Grand Canyon of Arizona (comprising perhaps the most stupendous natural phenomenon on the earth's surface), and many more. The United States now possesses over twenty parks, apart from the national forests, which are of immense extent, and many wild animal reservations administered by the National Parks Service of the Federal Department of the Interior. These great domains are found mainly in the Western States, and usually in the mountainous regions. They include superb examples of wild nature, and the aim has been to reserve tracts covering the largest possible variety of characteristic scenery—high peaks and glaciers, waterfalls and river canyons, gorges, caves, trees. Nor is the department content with what has already been secured. The latest annual report, for instance, contains the record of large additions to several of the great domains, such as the Sequoia National Park of California, containing a tract of the greatest trees in the world. The extension policy here is pursued because some of the noblest stands of trees had remained in private possession and were threatened with destruction. Another good example is provided by the Mammoth Cave of Kentucky. When I was in Kentucky a short time ago I found that the purchase of this tract was just being completed for the nation. It provided an excellent example of combined voluntary and public effort, the U.S. Parks Service having stepped in to complete the work done, over a period of several years, by the Mammoth Cave Association. The movement is now spreading in the Eastern States, for example, in the hill and forest country of Virginia and North Carolina, and it goes along with a

progressive parks policy carried on by the individual States, from which we in Britain may learn perhaps more directly than from the policy of the Federal Government.

Canada began to follow the United States' example at an early stage, and there are now eleven national parks under the Dominion Government, besides others, sometimes of great extent and always fine in scenery, owned by the Provincial Governments, especially Ontario and Quebec. The two greatest national domains of Canada are the Rocky Mountains Park, Alberta, established in 1885, which is 2,750 sq. miles (equal in area to Devonshire) and Jasper, marked out in 1907, also in Alberta (almost equal in area to Yorkshire). In addition to the national parks proper, Canada has six national reservations for wild animals—elk, buffalo, antelope, etc. I had the opportunity this last winter of visiting Jasper Park, which is very capably served by the Canadian National Railways. Here, on a plateau partly surrounded by a glorious range of snow peaks, there is a splendid playground where every kind of sport is available, with, close to the railway, a settlement of holiday houses and huts, Jasper Park Lodge, capable of accommodating some hundreds of travellers and visitors.

We must, of course, recognise that our problem in Britain is markedly different from that of Canada and the United States. Our distances are short; we think mainly of the growing needs of our masses of city dwellers. Our need is to secure for the people continued access to those stretches of wild country, which, under the traditional land system now rapidly changing, they have enjoyed from the beginning. We are only too familiar with the alarms, renewed every summer as some fresh area of fine country is declared to be in danger of road development and the speculative builder. It is now universally recognised that action is imperative; that we can no longer afford to go on without a considered policy and method, for the survey of the appropriate tracts and for purchase as opportunity may arise.

It is to be noted that there is general agreement as to the areas which are most suitable for initial consideration. Many are, for instance, listed in a recent small book on the subject by Dr. Vaughan Cornish, a well-known authority on the face of England. These areas include the Cairngorms and the English Lakes, the Forest of Dean, Dartmoor, the High Peak, the Pembroke Coast, the South Downs. The first definite programmes that have come under discussion are concerned with the Cairngorms as a first Scottish national park, and the Forest of Dean, to which Lord Bledisloe, Under Secretary for Agriculture in the last Government, gave actuality by his definite and generous offer. Apart from Lord Bledisloe's personal suggestions, the Forest of Dean has obvious advantages as a national playground, for it comprises an old coalfield, which is in great part worked out: almost the last in England where coal mining is an individual craft, carried on often in the miner's own yard. It is evidently a coalfield that is destined to revert to rural conditions.

Upon the important question of the policy to be pursued, in the event of the

Prime Minister's Committee on National Parks 'making favourable proposals, I will venture to say only two things. The first is that it would not be necessary to plan for very extensive purchases of land. If that were necessary, the public in England to-day would be tempted to conclude that any scheme for a national park must be impracticable on the ground of cost alone. But there is this to be said. When working upon the problem of perpetual access to hills and moors and other wild places (and that is the essential part of our problem), it would be necessary to arrive at some means of preserving the surrounding areas from devastation. It would, for instance, be ruinous if, having made certain parts of Dartmoor or the Lakes into permanent national playgrounds, the nation found that the environs lay at the mercy of the development forces in highroads and real estate. A national park cannot be right if its surroundings are wrong, and if its permanent seclusion is not secured. The second point is this, that an English parks policy must be related to the great cities and the movement of regional survey and regional planning, to which, happily, our associations and local government bodies are giving increasing attention.

One of the fears that have been expressed with regard to the policy of National Parks in England is that if we had such a policy the fount of contributions for invaluable bodies like the National Trust would dry up. As far as I can see, it would not take very much to dry up that fount, for we all know what a tremendous effort is necessary from year to year whenever the Trust makes an appeal for the salvage of some fine stretch of country which may be coming into the market. Experience in the United States and in Canada is decisively against any such fear. When, instead of the spasmodic and painful efforts we are accustomed to in England in the raising of money for the saving of beautiful natural spaces, there is the steady work of a National Park Service, and all the publicity that is attached to it, the result is a stimulus for the public which is interested in the movement, and also something which I think we badly need—a systematic and intelligent effort towards the education of our very rich men. When I compare the conditions in that respect in England with the conditions prevailing on the other side of the Atlantic, I am impressed by the gulf which exists between the idea of the social uses of great wealth amongst us and the corresponding ideas which prevail in America. Over there, where there are so many great fortunes, they have been successful in educating their rich men into a variety of uses for their money, and uses with a social value.

A word now about finance. The National Parks Service, which comes under the Department of the Interior in Washington, administers a budget every year of something less than five million dollars. That does not sound very much. As a matter of fact, however, America has had the great advantage of being able to secure great stretches of country for the public use at a very small initial cost. In 1929 the total appropriations for purchase and expenses of the National Parks Service was \$4½ millions, with additional authority to enter into contractual obligations for roads and so forth up to another 4 million dollars. There is a

deduction to be made from that, in the form of revenue from various sources in the parks ; in 1929 it amounted to about \$850,000.

Turning to what the Americans are doing in regard to their city parks and parks under the various State Governments, we find something which should be useful and stimulating to ourselves. We have gone forward with a local park system in connection with our towns and cities, which is very different from that in America. It has certain advantages over theirs. On the whole, in the parks of our cities the aim has been to bring them as far as possible within reach of the greatest number of people. The city park systems of the United States have, I think, been planned in the main under the influences of the motor-car, and, therefore, they are not so well within the reach of the pedestrian and the daily user as ours are. Nevertheless, there is no doubt as to the great value of the American development of city and State parks. I will take two illustrations. The first is the national capital of Washington, which is co-terminous with the district of Columbia. Ever since Washington was laid out in the early days of the Republic there has been a special interest displayed in the maintenance of the beauty of the city, and in later years, an increasing interest in the preservation of the fine scenery in its neighbourhood. When I was last in Washington, not many weeks ago, they were discussing the prospects of a Bill in reference to the public control of hydro-electric power in the district. The danger there is that some of the areas on the banks of the Potomac may be used by a private concern without adequate care for the beauty and amenity of the capital.

The other example I cite is the State of New York, whose people claim for it, on the whole, the finest range of public parks under the Government of any State in the Union. They are of remarkable variety, and provide us with some of the best examples that we can get of the general and particular uses of parks which are not difficult of access and yet belong to the category of national or State parks. The examples I choose are those of Bear Mountain and the Palisades, at a distance of an hour or so from the northern edge of New York City, overlooking the Hudson River. The provision here for both recreational and educational use is excellent and thorough. The description of the work in detail given in the latest annual report is unusual, furnishing evidence, I should say, of a system that has been admirably worked out on a sound community basis. The American problem of national parks, as I have explained, is very different from ours. But it is undeniable that in their practical development of the State park they have achieved something that is full of valuable suggestion for us.

The lecturer showed slides of typical western parks in the United States and Canada, and in particular a short series illustrating Bear Mountain, New York.

DISCUSSION

RR. HON. GEORGE N. BARNES, in opening the discussion, said that both the lecturer and the Chairman had seemed a little pessimistic about this country and had compared it, to its disadvantage, with America in connection with the subject

under discussion. Personally, he could only say that perhaps he was getting old, but he thought more of his little country now than ever he had done before, and now that he had more opportunities of going about England the more he was charmed with it. Where in America could one find anything better than in Derbyshire? He knew that America had improved wonderfully during the last few years, but when he had gone there in the '90's it had been a ragged sort of country. Of course, America possessed scenes of grandeur with which nothing in this country could be compared, but 35 years ago he thought England had been more beautiful than America. He was glad that the lecture had been delivered. It must increase the interest of everybody in the establishment in this country of something of the kind which they were developing in America. He was glad, too, that the Government had appointed a committee on the subject, which would, no doubt, ascertain the facts and see how far it was possible for this country, with its limited purse, to do something in the matter. There was reason to be proud of the fact that in this country the public had access to many beautiful places and had opportunities for enjoying their amenities. In particular he would mention the Duke of Norfolk's estate at Arundel. Then there were our own little village greens, than which he did not know anything better in the world, where the cattle grazed and the children played. The audience were under a debt of gratitude to Mr. Ratcliffe for his interesting lecture.

LADY TREVELYAN said she desired to make some comments on the pictures which had been shown of the national parks in America—comments which she feared were disparaging. There was no doubt that the Americans had a manner of doing things which was purely American and very un-English, and it might suit their country admirably; but she should be very sorry to think that any national parks which this country might have would turn out to be as definitely planned for entertainment and relaxation as apparently the American parks were. What she had in mind in hoping to see a great deal of our country turned into national parks (or, as she would much rather call them, national domains) was that they should be the original country in the state in which one knew it now. The word "park" to the English mind at once suggested refreshment kiosks, roundabouts and paddling pools for the children; but when one thought of the Forest of Dean or any of the Lakeland country, one could not visualise there the paddling pool or the refreshment kiosk. She hoped that many of the parks which she trusted would come into public hands in the course of the next few years would be natural parks as well as national parks.

MR. H. W. BARTER (Hon. Secretary, School Journey Association) asked in what sense the lecturer had used the phrase that educational use was made of the national parks in America. It would appear from the pictures shown that they were more used as national playgrounds. Again, was it the children of the richer Americans, whose subscriptions had gone towards the purchase of those parks, who were the main users of them, or were the main users University students, or who were they? If anything of the kind was established in England he hoped that steps would be taken to educate our children in the use and appreciation of our own national beauties, including our national monuments. He would suggest that the free access to these natural beauties of our country would remove a great deal of the dissatisfaction which was inalienable from the conditions under which people were compelled to live at the present day. The congestion in cities was apt to lead to a deterioration of morale. Access to country scenes and to scenes of natural beauty tended to uplift people, and to that end perhaps he might be permitted to say that

during the last twenty years there had been a movement in this country to get our children out of the congested areas into scenes of natural beauty.

MISS SOLLY, as representing the Royal Society for the Protection of Birds, thought the difficulty about national parks, from her Society's point of view, was that they would obviously mean free access for everybody, and, therefore, the wild life in a country like ours would be considerably disturbed. No one could object to the people of the country enjoying our lovely countryside, but from the point of view of birds in particular it might mean that their preservation would be endangered.

MISS D. M. HUNTER said there were great differences in the problem as between the United States and this country, but where there were points of similarity they certainly should be copied here. One of those points was the matter of park ways, and in that matter America's lead might well be copied. One noticed that in this country, in the main, the hedges or fences of cottages or houses went right up to the road, whereas in America there were broad green strips of path between the houses and the road. The public authorities of this country should make it one of their chief aims in all their schemes of development that practically every road in the country—certainly every main road—should be provided with natural pathways of grass and trees. The lecturer had not mentioned the fact that this country had a natural advantage in the matter of its commons, one of which was in reach of almost every town. These commons ought to be most jealously guarded in every way, as they were the embryo of national parks.

SIR HENRY MIERS, F.R.S., remarked that his acquaintance with national parks was a very limited one. 'Thirty-three years ago he had camped out in Yellowstone National Park, and in those days it had been the idea to preserve a large tract of country absolutely unchanged and unspoiled. That had been before the days of motor cars. If the slightest damage was done by a person the offender was seriously punished. As he had said, the idea had been to preserve unspoiled and intact the natural beauties of the country, and it would be interesting to know whether that original idea had been successfully carried out down to the present day.

MR. RATCLIFFE, in reply, said he had been rather appalled when Mr. Barnes had begun to speak to realise that he might have left on the minds of a good many of his listeners something to the effect that he had been drawing a comparison between this country and the United States, and that he had come down heavily on the American side. He could assure the audience that that was not at all the way that an elderly Englishman spoke when he came back to his country after an absence of five months of continual travelling in the United States and Canada. He was not suggesting any comparison to this country's disadvantage; on the contrary, the more he had gone over the subject in preparation for his lecture the more overwhelmed he had been with the thought of the "infinite riches in a little room," which was our national heritage. He agreed with Mr. Barnes in his happy use of the description of America as a "ragged country." The first thing that struck an Englishman on returning home from America was, on the whole, the general neatness of his own country. He strongly agreed with what Lady Trevelyan had said, and he would be pleased in future to use the phrase "national domain" rather than "national park"; but when a particular label was attached to anything, and it became a matter of general public discussion, it was very difficult to change it. With regard to maintaining the country in the

state in which it was now, that would unquestionably be a point very close to the minds of those who were leading in the movement for national parks. If the movement went forward at all, we in this country could do something which the Americans had been totally unable to do, and that was to preserve the special tracts of our beautiful country from access by motor cars. A first strict regulation which he would hope to see imposed would be that there should be, in many of these places, no motor cars admitted at all.

With regard to the question of the educational use of national parks: on account of their remoteness some of the national parks in America were only for the relatively few, but the movement among students of American universities for long-distance holidays through the parks was growing very rapidly indeed. No national park in Western Canada or the United States ever had any difficulty in getting students to share in the educational facilities offered. Mr. Barter had been wrong in thinking that he wished to imply that only the richer people were beneficiaries of the national park system. Allowing for the fact that the American aim from the start had been to have large areas in the remote mountain districts, by the enormous development of tourist traffic in recent years the people in general to a very large extent enjoyed the advantages offered. In reply to Sir Henry Miers, it was undoubtedly true that he had seen the Yellowstone Park from a favourable point of view and at a fortunate time. The motor car, which had brought with it the building of immense trans-continental motor highways and an enormous service of motor coaches through the national parks, had undoubtedly changed the character which had pleased him so much when he had visited the place long ago. The authorities were attempting to deal with that by the setting aside of special regions for the preservation of animal and bird life, and they could do that with considerable success because of the extent and the number of the areas that they had to deal with. There was no limit to the number of people and the classes of folk who enjoyed the parks under the New York authority. The parks in that State were very accessible. Everything was done to enable the highest percentage possible of the children of all grades of society to visit the parks. The question of access was a cardinal matter, and Sir Charles Trevelyan held the view that it was the central point of the whole question. He entirely agreed with the speaker who had referred to park-ways. We were in that respect singularly backward, and even the designers of our new arterial roads had not taken quite obvious lessons from other countries. That was one matter in which the Americans were well ahead of us. He also agreed in the matter of our commons, but care had to be exercised in this respect, as many of the commons were not yet secured to the public.

A hearty vote of thanks to the lecturer terminated the meeting.

NOTES ON BOOKS

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH: REPORT FOR THE YEAR 1928-29. London: H.M. Stationery Office 3s. 6d. net.

Once more this annual Report has to record a highly satisfactory output of work by the various Research Associations and Institutions connected with the Department. The best known, perhaps, of these Institutions is the National Physical Laboratory, where the number of tests and special investigations exceeded the record for any previous year. Of exceptional interest were the studies made on the Laboratory's Aerodynamic Department of the designs of the British machines competing for the

Schneider Trophy, and of Sir Henry Segrave's Golden Arrow car. It appears that these tests contributed materially to the British successes, and to the safety of the British competitors. The aerodynamical investigations also included experiments on the spinning of aeroplanes, with particular reference to the behaviour of the tail unit in a spin; work on a model of the R100, for the Airship Guarantee Co., Ltd.; and a report on the Cierva Autogyro. Research with the William Froude National Tank proceeded continuously, and some interesting data were obtained as to the influence of waves on the resistance, propulsion and pitching of passenger vessels on Atlantic voyages during the worst period of the year. Closely allied to this work was the research of the air-resistance of ship and superstructure, in which a novel method was applied. There was a substantial increase in the number of ship models tested for commercial firms, and the need for additional tank accommodation was seriously felt.

Food investigation benefited considerably from extensions to buildings and plant (thanks to substantial grants from the Empire Marketing Board) at the Low Temperature Research Station at Cambridge, the Fruit-storage Station at East Malling, and the Fish Research Laboratory at Aberdeen. One conclusion of some interest which seems to have emerged is that the widespread dislike of frozen beef may be due to inferiority in the original quality of the meat rather than to the effects of freezing.

The welcome increase which is now to be noted in the degree of industrial co-operation received was well exemplified in connexion with building research, the British Steelwork Association having offered to meet half the cost of a general investigation of problems bearing on the use of steel in structures. This is an inquiry of great importance, as the standard "safety" regulations governing the design of steel structures in this country are now some fifty years old, since when a great advance has taken place, not only in the quality of steel, but in our knowledge of the theory of structure—the latter having been largely brought about, curiously enough, by the development of aircraft.

On the financial side the position of the various Research Associations continues to give some anxiety, and it can hardly be said that a satisfactory solution to that problem is even in sight. The most promising suggestion at present seems to be that of some sort of compulsory levy on the trades in question, but no sufficient body of experience is yet in existence for the formation of a reliable opinion on the merits of this method. One point which may have some bearing on the question is the frequent observation that far too big a gap elapses between the completion of a successful investigation and the application of its results in practice. Some such gap there must be, since the commercial aspects of industry present problems quite as difficult of solution as those met with on the technical side; but there can be no doubt that a more welcoming attitude towards results would do much to stimulate the financing of technical research.

MEETINGS OF OTHER SOCIETIES DURING THE ENSUING WEEK.

- MONDAY, JUNE 23. Architects, Royal Institute of British, 9 Conduit Street, W. 8.30 p.m. Captain C. S. Peach and Mr. W. G. Allen, "The Restoration of St. Paul's Cathedral."
Geographical Society, at the Æolian Hall, New Bond Street, W. 3 p.m. Annual General Meeting.
TUESDAY, JUNE 24. Anthropological Institute, 52 Upper Bedford Place, W.C. 8.30 p.m.

- Heating and Ventilating Engineers, Institution of, at the Grand Hotel, Eastbourne, 10 a.m. Mr. I. Lubbock, "A Review of the Present Position of Automatic Heating by Oil Burning."
Quekett Microscopical Club, at 11 Chandos Street, Cavendish Square, W. 7.30 p.m.
WEDNESDAY, JUNE 25. Geological Society, at Burlington House, W. 8 p.m.
FRIDAY, JUNE 27. Physical Society, at the Imperial College of Science and Technology, South Kensington, S.W. 5 p.m.

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No. 4049

FRIDAY, JUNE 27th, 1930

VOL. LXXVIII

*All Communications for the Society should be addressed to the Secretary, John Street,
Adelphi, W.C.2.*

NEWS OF THE WEEK

"As the story goes, Dagon fell. Never believe it. If he did, it is not so very noticeable. He is, in fact, very firm upon his throne. Yet every poet, and every good reader, must believe in his heart that some day the ugliness which is supreme shall be laid low. What other reason can there be to make us cheerful and hopeful at our tasks?"

H. M. Tomlinson.

Theatres.—"SAINTE JEANNE" AT THE GLOBE THEATRE.—We have mentioned before in these pages the splendid work Messrs. Maurice Browne and Cochran are doing for theatregoers at the Globe and Queen's theatres. Last week we had the privilege of seeing George and Ludmilla Pitoëff from the Théâtre des Arts, Paris, in their version of Shaw's "Saint Joan."

No greater contrast could be imagined between the English and French productions, each a magnificent interpretation. Madame Pitoëff's Joan was the saint rather than the peasant girl, and whether one enters into her view or the more vigorous characterisation of Sybil Thorndike is entirely a matter of the temperament of the onlooker. One can only say that Madame Pitoëff's was a wonderful and moving performance and in the trial scene one recognised her as a very great tragic actress. The production was also extremely interesting, the blue of the background and the grouping of the Trial scene being particularly striking. It was a very clever touch to get the trial seats raised leaving St. Joan in the middle, which gave the effect of tremendous power crushing down upon her. The flame curtains and the grouping of the figures round the bed at the last were also excellent.

We were sorry the audiences were not larger though they were very appreciative.

This week we look forward to the arrival of the Japanese players at the same theatre—the last production of the International Season.

Art Galleries.—LONDON ARTISTS' ASSOCIATION.—The present exhibition of English Landscape Painting from 1750 to 1930 at Cooling's Galleries, 92 New Bond Street, was arranged to celebrate the opening of the London Artists' reconstructed premises. It is succeeding perfectly, not only because of its historical value, but because so many of the pictures selected are thrilling both in isolation and in their actual context. There are two Constables, a large one and a small one, which show the amazing combination of solid craftsmanship and lyrical virtuosity that give the great man such a wide appeal. It looks as if somebody had at some time tried to improve on the foreground of the larger picture—the detail is rather refined, and out of scale with the background—but even so, this gracious view of Salisbury remains enchanting. There is a picturesque Gainsborough, with the air of being a fragment; a wistful Crome; a Wilson that does not give an adequate idea of the painter's immense powers. One of Mr. Roger Fry's pictures here to be seen must be among his very best: the great critic has brought his demure originality to a quiet perfection. That he has managed to remain so personal is remarkable. Neither the old masters he has studied, nor the new masters he has fostered, have managed to seduce him from his independence.

Duncan Grant's "Corn Field," less striking at first than his "Vale of Health," with its fascinating reflections in the water, is yet fuller of loveliness. A book could be written about it. Cézanne wanted "Poussin done again after Nature." It is something like this that Grant has achieved.

The historical part of the Exhibition remains open till July 5th, but a collection of landscapes and still-lives by London Artists, now on the first floor, will be moved upstairs and will go on till the end of July.

FESTIVAL OF ENGLISH CHURCH ART, CAXTON HALL, WESTMINSTER.—This Exhibition, the first ever organised by the Church Crafts League, Dean's Yard, Westminster, during the thirty years of its existence, is one of the most interesting that have been held for a long time. One of the chief functions of the League is to give advice on all matters of church decoration and furnishing, such as communion plate, sculptures in wood or stone, fabrics and embroideries, stained glass, frescoes, and so forth, and its ability to do so is indicated by the high standard of the exhibits, many of which are exceedingly fine and would bear comparison with similar work done at any previous time. What could be better than the alms dishes, candlesticks, and crosses, in silver and brass, by Omar Ramsden, and the delightful silver alms dish with its beautiful lettering designed by Eric Gill? There are also some very satisfactory pieces by A. J. Wilkins, Edward Spencer and others which show that good silversmiths still exist in England, though how long they will continue to do so unless they receive more encouragement is another question. Harold Youngman's figures in carved wood of Thomas, called Didymus, Ishmael, and St. George, have a wonderful feeling and vitality, and remind one of the best medieval work, as does also, in another craft, the large dossal of crimson damask with the figure of the risen Christ, designed by J. N. Comper,

and embroidered by St. Mary's Convent, Wantage. There is an interesting drawing of the interior of a reinforced concrete church by Philip A. Robson, F.R.I.B.A., cartoons for stained glass windows by R. Anning Bell, stained glass by Geoffrey and Christopher Webb, and others, illuminated M.S.S. by Graily Hewitt and Miss Jessie Bayes, and some exceedingly fine mosaic work by Madame Verna Akerberg.

A banner, designed by Duncan Grant and executed by Mrs. Antrobus and Mary Hogarth, though perhaps not one of this great artist's most successful efforts, reminds us that ecclesiastical art need not necessarily be unreceptive of modernistic influences. The exhibition, which remains open until July 2nd, should be visited by everyone who can possibly do so. The well produced and finely illustrated handbook will be of permanent value as a guide on matters of ecclesiastical art.

THE GOUPIL GALLERY.—SUMMER EXHIBITION OF MODERN ART.—Occasionally an exhibition of this kind is most disappointing and gives quite a wrong idea of what it sets out to accomplish; especially this is so in the case of modern art. In this show however, there is much that is interesting and stimulating, and almost every point of view of modernism seems to be represented.

To take a few names at random there are works by Sickert, John. Eric Gill, Pryde and R. O. Dunlop; in fact, there is infinite interest and variety, both of style and medium, in wood and stone, water colour and oil. There are four particularly beautiful little sketches by James Pryde which should not be missed, a picture by Sickert called "Conversation" (No. 103), with a wonderful lighting effect and there are one or two striking pictures by Nadia Benois, which have a bold flamboyant line, especially "Freda" (No. 54), and a study of grapes.

Mr. Eric Gill has two very decorative pieces of sculpture, "Eve" and "Chloe," with an interesting colour effect and particularly beautifully designed drapery.

It is impossible to do more than touch on one or two exhibits in this show which is really most significant and representative, and very well worth a visit to anyone interested in the progress of contemporary art.

Books.—WIND FROM THE WEST, by Pamela Hinkson.—Among the masses of problem and sex novels which flood the market at present one cannot help feeling that a book like this comes as a breath of fresh air! The majority of novelists now seem frightened of breaking new ground, and we are getting infinitely tired of the epigrams of Bohemia and the cocktails of Mayfair. Here Miss Hinkson, with great sense of beauty and colour in her writing, takes us to the Faubourg St. Honoré and the life of two generations of the French aristocracy up to the present time when the "Wind from the West" blows in upon them in the shape of a young American who loves Solange, the daughter of the great house.

Miss Hinkson has a special gift for creating an atmosphere, one can almost hear the trees tapping at the window and smell the mustiness of past glory in the old

salon. Sometimes the story is almost too much subservient to the picture, but we are grateful for the picture all the same, and the delicate sense of beauty and sympathy with which it is painted.

HOW ABOUT EUROPE? by Norman Douglas.—There is a mixture of humour and bitterness in this book which in spite of its attacks on almost every existing law and institution in England, makes it very entertaining reading. It is a satirical rejoinder to "Mother India" and Mr. Douglas regards Europe through the same spectacles as the author of that sensational book. Mrs. Mayo was grimly serious—Mr Douglas is grimly humorous. He says "The reader will find no suggestion of remedies in these pages; I am not the stuff of which reformers are made, I observe and pass on," but the observations make very interesting reading and there is much food for thought therein, and fearless attacks on some time honoured customs and regulations which England so needlessly and firmly imposes.

PROCEEDINGS OF THE SOCIETY

INDIAN SECTION

SIR GEORGE BIRDWOOD MEMORIAL LECTURE

FRIDAY, APRIL 4TH, 1930

SIR E. DENISON ROSS, C.I.E., Director, School of Oriental Studies, University of London, in the Chair

THE CHAIRMAN said that it was a great pleasure to him to introduce the lecturer, Sir Wolseley Haig, soldier, administrator, and scholar. When one listened to a discourse on any phase, period, or race of India, such as the one to be dealt with in that lecture, there were many sources to which one might turn for information. Some of the best of these were those for which they were indebted to the great scholars, who were either soldiers or administrators or both, in India. Some of these scholars wrote an admirable style, but had no means of referring to original sources. There were also sources of information afforded by notable Indian scholars, and on the subject of the present lecture there were two outstanding Indian writers who had written valuable works. Then there were also sources of information in the shape of works which were less reliable. But in dealing with this subject Sir Wolseley Haig could bring to bear, as very few former authorities had been able to do, not only a personal knowledge of the country and the people, but a first-class linguistic equipment. In addition to his historical qualifications, he was a great linguist, having a profound knowledge of the languages in which the original sources were written. When he stated what he knew he could, if required, quote the original sources in the original tongue. He had much pleasure in calling upon him to deliver his lecture.

The following lecture was then delivered:—

THE MARATHA NATION

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The nation of which I have undertaken to speak to you this afternoon is the nation which Great Britain succeeded as the dominant power in India. Its dominance was not of long standing, but when, in the latter half of the eighteenth century the East India Company began to rise to the position of the dominant power the Marathas held the greater part of what is now the Bombay Presidency, the Carnatic, the Central Provinces and Berar, Orissa, and Central India; their influence controlled Rajputana, the dominions of Nizam-ul-Mulk in the Deccan, and the court of the puppet emperor. "The pre-eminence to which they had attained was animating and glorious; their right to tribute was acknowledged on the banks of the Coleroon, and the Deccan horse had quenched their thirst from the waters of the Indus."

Their country lies in the west of India, extending down the coast from Daman on the north to beyond Goa on the south. Its northern boundary is a line running due east from Daman for rather more than a hundred miles, and then turning north-east and meeting the Wardha River, which is its eastern boundary. Its southern boundary is the Penganga River, as far as the salient angle of Umarkhed and thence a line running south-west to Kolhapur and there turning south down the line of the Ghats and meeting the sea below Goa. This is Maharashtra, the country of the Marathas, and it contains three natural divisions, the Konkan, or the country lying between the Western Ghats and the sea, the Maval, or the highlands of the Western Ghats, and the Desh, or so much of the plateau of the Deccan as is contained within the boundaries which I have described.

The nation consists chiefly of two kindred tribes, the Marathas and the Maratha Kunbis, numbering together about nine millions. If they can be described as a caste "their history and traditions stamp them as a caste of the national type." The Marathas consider themselves superior to the Kunbis, but the two tribes were not originally distinct, and that they are closely connected is evident from the facts that a Maratha will take a Kunbi wife, though he will not marry his daughter to a Kunbi, and that a wealthy Kunbi occasionally gains promotion to the higher grade and ranks as a Maratha.

Their language is as purely Aryan, or Sanskritic, as any language now spoken in India, but ethnologists, basing their conclusions on anthropometrical data, place not only the Marathas and Kunbis, but even the Brahmans of Maharashtra, in the Scytho-Dravidian group of Indian nations. The assignment of the Brahmans to this group conflicts with the old orthodox belief that Brahmans in all parts of India are pure Aryans, but this is hardly more credible than the old myth that the demiurge Brahma caused the Brahman, the Kshatriya, the Vaisya,

and the Sudra to spring from his head, his arms, his thighs, and his feet. Brahmans were certainly not always so strictly endogamous as they are now, and those who long ago joined non-Aryan tribes for the purpose of performing priestly offices for them certainly intermarried with them. Moreover, there is little doubt that in some cases " Brahmans " were locally manufactured from the tribal priesthood. The popular designation of the Brahmans of Maharashtra, " Maratha Brahmans " is probably far less incorrect than they allege it to be.

The Marathas, and especially ninety-six families who form their aristocracy, claim Rajput descent, wear the sacred thread, marry their daughters before puberty, and forbid the re-marriage of widows, but their claim is not admitted by the Rajputs of Rajasthan. Early in the fourteenth century Shankar Deo, son of the Maratha raja of Deogiri, sought in marriage Deval Devi, the daughter of Karan, the Vaghela raja of Gujarat, who indignantly refused to give his daughter to one not a Rajput, and only relented when it appeared certain that the girl would be carried off by Muslims to the harem of a Muslim prince, which, in the end, was her fate. The Rajput legend was revived on the occasion of the coronation of the great Shivaji in 1674, when, after many solemn rites, and the expenditure of vast sums of money in alms to Brahmans, the Brahmans obligingly supplied him with a pedigree from a mythical Sesodia immigrant into the Deccan, and solemnly invested him as a *Suddhakshatriya*, or " Pure Kshatriya " with the sacred thread, but the Rana of Mewar, chief of the Sesodias and premier Rajput chief in India, never acknowledged him as a kinsman.

When the Marathas first entered Maharashtra we do not know, but they appear to have held fiefs there, and forts, especially in the Konkan and the Maval, from the earliest times of which we have any historical knowledge, and in the twelfth century Maratha chiefs were feudatories of the Western Chalukyas, whose capital was Kalyani, near Bidar. One, Bhillama, of the surname of Seuna, which was changed to Yadava—another instance of Rajput pretensions—governed the northern Deccan, and at the end of this century he and the Hoysala raja of the Peninsula overthrew the Chalukyas, and assumed independence. The Yadavas held Maharashtra, by 1250 they had reduced the great feudatories of the Deccan to obedience, and ten years later had subdued the Konkan. We now for the first time meet with Brahman generals, and Brahman provincial governors, employed in preference to hereditary local chiefs, whose power was dangerous. The Yadavas had no powerful enemies on their frontiers and we know little of their foreign relations. They were cut off from Northern India, and the author of the *Zafar-ul-Walih*, a history written in the reign of Akbar, the Arabic text of which has been edited by the Chairman from a unique holograph manuscript which he discovered, says that the Maratha kingdom had never heard of Islam until it was invaded in 1294 by Ala-ud-din Khalji. " Their kingdom was peaceful and prosperous; the treasury was full; many temples were built, learning flourished, and a vernacular literature began to spring up; but all these

fair prospects were dashed by the sudden appearance of Ala-ud-din Khalji, with 8,000 men, before Deogiri in 1294. He carried off the treasures of Ramchandra, the reigning king, and exacted a promise of tribute." Harpal, Ramchandra's son-in-law and the last of the dynasty, was put to death in 1318, and the Deccan became a Muhammadan province.

Before the middle of the fourteenth century the Muslim rulers of Delhi had established their authority over the whole of Southern India, but in 1347 the Deccan, that is, the tract between the Narbada on the north and the Krishna and the Tungabhadra on the south was wrenched from them by a rebellion of the local officials and became a separate Muhammadan kingdom under Ala-ud-din Bahman Shah, whose descendants ruled it for a century and a half. Under this dynasty the Maratha chiefs retained their strongholds and their lands, and contributed contingents to the Royal Army. In 1490 the great kingdom of the Deccan broke up, and its provinces became five independent Muhammadan kingdoms, of which the two smallest were afterwards absorbed by two of the largest, leaving three kingdoms, Ahmadnagar, Bijapur, and Golconda. The territories of the first two covered the whole of Maharashtra, and Maratha chiefs served with their contingents in the armies of both, and often attained to high office in the State. Some even entered the service of Golconda, but these were mere mercenaries, for that kingdom lay beyond the bounds of Maharashtra. In Ahmadnagar they were regarded with special favour, for the kings who ruled that State, though Muslims, were descended from a Brahman family of Pathri, near the Godavari, and never forgot their Brahman descent.

At the close of the sixteenth century there were seven great Maratha chiefs and several others of less note in the service of Bijapur, and in that of Ahmadnagar there were, besides several minor chiefs, Lakhji Jadav Rao, Deshmukh of Sindkhed, and Maloji Bhonslé of Verole (Ellora). Jadav Rao claimed descent, with much probability, as Grant Duff says, from the Yadava Rajas of Deogiri. The Bhonslés were a respectable family, but of much less importance, and Jadav Rao was highly indignant when Maloji interpreted some jocular remarks of his concerning their infant children as a contract of marriage; but Maloji rose in the world, received from Murtaza Nizam Shah III the title of raja and the nominal command of 5,000 horse, and was able, with the King's support, to induce Jadav Rao to give his daughter Jijibai in marriage to his son, Shahaji. Of this marriage were afterwards born two sons, Sambhaji, the elder, and Shivaji, born at Junnar in May, 1627.

Of the extinction of the kingdom of Ahmadnagar by Shahjahan in 1633 Jadav Rao entered the imperial service, and Shahaji that of Bijapur, retaining his *jagirs* in the neighbourhood of Poona, but receiving also other large grants in the Carnatic, where he chiefly resided, with his elder and favourite son Sambhaji, leaving his northern estates under the management of his agent, Dadaji Kondeo, to whom was also entrusted the education of his younger son, Shivaji.

It is impossible, in the course of a short lecture, to discuss the policy, the campaigns, the administration, and the achievements of the great Shivaji, but I

must attempt a short sketch of his career, for without such a sketch it is impossible to appreciate the magnitude of the task which he set himself, the establishment in India of a great Hindu power, or the great measure of success which he attained.

On the death of Dadaji Kondeo he assumed the management of the northern *iagirs* as though they were his own, remitting revenue neither to his father nor to the State. He captured, acquired by bribery, and built a large number of hill forts and took possession of the lands which they dominated. His depredations excited both alarm and indignation in Bijapur, where it was suspected that he was acting under secret instructions from his father, who was now Governor of the Carnatic province, though he was, in fact, in rebellion against his father as well as against the State. Shahaji's protestations of innocence were not believed, another Maratha was bribed to seize him and send him to Bijapur, and he was imprisoned. Shivaji desisted for the time from any further acts of aggression, and approached the Emperor Shahjahan, entreating him to obtain the release of his father. Shahjahan welcomed the opportunity of interfering in the domestic affairs of Bijapur, and the King, fearing lest Shivaji should transfer both his services and his estates to the Empire, released Shahaji, and after a time permitted him to return to the Carnatic.

Shivaji was most favourably situated for the attainment of his object, and took every advantage of his situation. The kingdom of Bijapur was entering upon the last stages of decay; the central authority was weak and was distracted by the intrigues and the feuds of factious and turbulent nobles. Disorder in the Carnatic and the constant menace of invasion from the north strained the military resources of the State to the utmost, and the rebel was further protected by the fear lest he should transfer his allegiance to the Empire, and by the nature of the country which he held, "wild and broken, covered with tracts of jungle and dense forest, its numerous hill-tops crowned with rudely-constructed, but often formidable, forts." The Imperial Viceroy, on the other hand, had no motive for molesting one who was in rebellion against Bijapur, and when Aurangzib, who held the office, invaded that kingdom Shivaji stood aloof. When Aurangzib was called away by the news of his father's serious illness, Ali Adil Shah of Bijapur attempted to punish the rebel, but he assassinated at a private interview Afzal Khan, who commanded the first force sent against him, and dispersed his troops, and he outwitted and defeated in detail the officers who commanded the second army sent against him. His assassination of Afzal Khan was, perhaps, the most blameworthy act of his life. Having disposed of his enemies from Bijapur he turned his attention to the imperial province of Ahmadnagar, occupied part of it, and raided it almost to the gates of its capital, Aurangabad. Aurangzib, who had now ascended the throne, sent his uncle, Shayista Khan, to pursue the impudent "mountain rat," as he contemptuously termed the great Maratha, and Shivaji withdrew into his fortress capital, but with a few chosen companions entered Poona in disguise, broke at night into the house occupied by the Viceroy, slew his son and his guard, and wounded Shayista Khan himself, who narrowly

escaped with his life. After this ignominious failure he was recalled, and Aurangzib sent as Viceroy to the Deccan his second son, Mu'azzam, an unwarlike prince, with whom Shivaji, whose funds were now ample, was able to conclude an armistice on very favourable terms. On his father's death in 1664, Shivaji assumed the title of Raja and struck coin in his own name, and Aurangzib sent against him his most efficient general, the Raja Jay Singh, of Amber. Jay Singh reduced him to such straits that he sued for peace. The Raja received him with great courtesy, and at Pandharpur concluded a convention with him, Shivaji agreeing to attend the Imperial Court, under the Raja's safe conduct. He left the Deccan in March, 1666, with his young son, Sambhaji, and an escort of his own troops, but was unable to conceal his resentment at Aurangzib's reception and treatment of him, and demanded permission to return to his *jagir*. Aurangzib returned an evasive reply, and caused a guard to be mounted over his house. The device by which he effected his escape is well known. He made his way to Muttra, whence he travelled, disguised as a pilgrim, by devious routes to the Deccan, reaching his fortress-capital, Raygarh, after an absence of nine months.

The welcome which he received from his servants and his subjects has been compared with that received by King Charles II at his Restoration, and he lost no time in settling his account with the Emperor. He recovered the Konkan and most of the other possessions which he had ceded under the Convention of Pandharpur. Jay Singh was now besieging Bijapur, with little prospect of success, and, on perceiving that his line of retreat was threatened by Shivaji, retired to Aurangabad, and was recalled from the Deccan, but died at Burhanpur. Mu'azzam was again sent to the Deccan, and was again cajoled by the Maratha not only into making peace, but even into obtaining Aurangzib's sanction to Shivaji's retention of the forts and lands which he had recovered, and to the revival in his favour of the title of raja which had been conferred by the Ahmadnagar kingdom on his grandfather, Maloji.

Shivaji, now at peace both with the Empire and with Bijapur, had leisure to perfect his system of administration. His government was organized in eight departments, each presided over by a responsible minister, the chief minister being dignified by the Persian title of Peshwa. The machinery of the administration was simple but efficient, the pernicious old Maratha institution of hereditary office was set aside, and Shivaji, recognising the danger of a powerful feudal aristocracy, granted no fiefs, public servants of all ranks, both civil and military, being paid directly from the treasury, and all being subject to summary dismissal for misconduct or inefficiency. He was accessible to all his subjects, and commanded such devotion as no other contemporary ruler in India could. There is little doubt that the districts permanently occupied by him enjoyed better government than any of the neighbouring provinces, either of the Empire or of Bijapur.

The guilty conscience of Aurangzib seldom allowed him peace, and the unwonted calm in the Deccan aroused in his mind the suspicion that his son was conspiring

with Shivaji to treat him as he had treated his father. He accordingly ordered Mu'azzam to arrest Shivaji and send him to court, but private information that such an order was about to be issued enabled the prince to warn Shivaji, who accordingly withdrew his representatives from Aurangabad, and Mu'azzam, when he received the order, was able to inform his father that it was impossible to execute it. The Emperor's duplicity once more threw the Deccan into confusion. Shivaji captured several imperial forts, plundered Surat, and, invading the kingdom of Golconda, extorted from its ruler a large sum of money as the ransom of his capital.

On June 6th, 1674, Shivaji was crowned, and assumed the titles of Maharaja and *Chhatrapati*, or "lord of the umbrella." This was an act of defiance, and Shivaji was well aware that Aurangzib, who had hitherto affected to regard him with contempt as a turbulent minor feudatory, might at length perceive that he was a danger to the Empire, and put forth his whole strength against him. He forestalled him by conceiving the design of establishing in Southern India a great Hindu State, which might be able, like the kingdom of Vijayanagar in days gone by, to resist the strength of Muslim India. His pretext was the recovery from his half-brother, Vyankoji, of his share in the Carnatic *jagirs* of their father, Shahji. He bribed Bahadur Khan, Viceroy of the Deccan, to refrain from attacking his northern dominions during his absence, and led an army of 70,000 men through the kingdom of Bijapur into that of Golconda. Here he visited the King, Abu-'l-Hasan Quth Shah, at Hyderabad, and gained his active sympathy by entering into an offensive and defensive alliance with him against the Empire.

The Carnatic campaign was the greatest military exploit of Shivaji's life, and marks him as the greatest soldier of his age in India. I cannot enter into the details of it, but the Carnatic was part of the kingdom of Bijapur, of which Shivaji's brother, Vyankoji, was a vassal, and he overcame both the troops of Bijapur and those of Vyankoji. As Mr. Kincaid says, "In the course of eighteen months, at a distance of 700 miles from his base, he had conquered a territory as large as his former kingdom. While a single reverse would have been fatal, he had not suffered even a single check. Victory had succeeded victory; town had fallen after town. As he went, he organised his conquests, and when he returned to Raygarh his new possessions were securely bound together from sea to sea by a line of fortified strongholds held by garrisons brave to the death and devoted to his cause." He allowed his brother to retain, as his vassal, Tanjore and some territory in its neighbourhood.

The treachery of the Viceroy, Bahadur Khan, had been discovered, and he had been recalled from the Deccan. His successor, Dilir Khan, had, in alliance with Bijapur, attacked the kingdom of Golconda, Shivaji's ally; but the Bijapur troops had not been paid, and had melted away, and Dilir Khan was unable, without their help, to cope with the army of Golconda. Mu'azzam was sent again to the Deccan as Viceroy, and Dilir Khan was ordered to invade the feeble kingdom of Bijapur, on the pretext that the young King's sister, Padshah Begum,

who had been betrothed to one of Aurangzib's sons, had not been sent to the Imperial Court. The princess surrendered herself, but Dilir Khan continued his advance, and the Regent of Bijapur appealed to Shivaji for help. Shivaji cut the communications between Bijapur and Aurangabad, and between Aurangabad and Burhanpur, and then sent a force under his son Sambhaji to the relief of the city, but Sambhaji deserted to the Imperial Army, and was rewarded for his treachery with the command of 7,000 horse, and the siege continued. Aurangzib could not trust anybody for long, and ordered Dilir Khan to seize Sambhaji, who merited the confidence of none, and to send him to Court, but Dilir Khan was more honourable than his master, and allowed his guest to escape. Meanwhile Shivaji had cut off supplies both from the besieging troops and from Aurangabad, their source of supply, and Dilir Khan was obliged to raise the siege. In acknowledgement of his aid, Shivaji received the formal cession of all the territory which he had conquered in the Carnatic, and the Bijapur State recognised Vyankoji as his vassal, not its own.

Shivaji had now reached the zenith of his power. "He had freed the bulk of the Marathi-speaking people. By his new alliance with Bijapur and Golconda, and still more by the chain of fortresses which he had built from Bednur to Tanjore he had secured his conquests." His last days were darkened by domestic trouble. His son Sambhaji had proved himself unfit to succeed him; his third wife Soyarabai, harassed him to designate her young son Rajaram as his heir, and his brother Vyankoji, neglecting all the public business of his great charge in the Carnatic, was posing as a religious recluse. Shivaji sent him an affectionate but reproachful letter, and this was the last letter that he wrote. A painful swelling of his knee-joint brought on an attack of fever, from the effects of which he died on April 5th, 1680, in the fifty-third year of his age.

The scanty justice which the memory of this great man has received at the hands of most of our historians is due partly to the influence of Muslim historians of India, who could seldom see in him anything but an infidel dog, "the incarnation of successful perfidy," a rebel, and a bandit; and partly to that of the Marathi *Bakhars*, historical memoirs by authors prepared, in their fierce hatred of Muslims, to attribute to their hero as virtuous acts almost any atrocity. Shivaji practised guile, but only against those guilty of perfidy or treachery against him. As a Hindu patriot he hated the Muslims, above all the bigoted and perfidious Aurangzib, but he respected their religion, and all that they held sacred, for he was himself deeply religious. He was also chivalrous and virtuous, and was unquestionably the greatest soldier of his day in India, perhaps the greatest soldier whom India has ever produced. Even Aurangzib was at length compelled to admit that he was a great captain, and added, "My armies have been employed against him for nineteen years, and, nevertheless, his State has always been increasing." Another Muslim writes: "He always strove to maintain the honour of the people in his territories. He persisted in rebellion, plundering caravans, and troubling mankind, but was absolutely guiltless of baser sins, and was scrupulous of the

honour of the women and children of the Muslims when they fell into his hands." He was not only a soldier, for, as Mr. Kincaid, whom I have already quoted, says, "to his warlike genius were joined civil talents of the highest order. While training troops, devising strategy, inventing tactics, he yet found time to think out a system of administration which, as Mr. Justice Ranade pointed out, is the basis of British success."

Rajaram, Shivaji's younger son, was enthroned in Raygarh on his father's death, but Sambhaji, displaying unwonted energy, secured the allegiance of the greater part of the Maratha Army, entered Raygarh, confined his young brother, and, summoning the boy's mother before him, grossly insulted her, accused her of having poisoned his father, and put her to a cruel and lingering death. He was enthroned as Maharaja in August, 1680, and early in the following year Akbar, the rebellious son of Aurangzib, fleeing from Rajputana, sought an asylum in Maharashtra. Sambhaji received the princely fugitive with great honour, saluted him as Emperor, and held out some hope that he would help him to dethrone his father, but first occupied himself in an unsuccessful attempt to seize some of the ports of the Konkan. At the end of 1681 Aurangzib, having made peace with the chiefs of Rajasthan, appeared once more in the Deccan, where he was doomed to spend the remainder of his long reign in the vain attempt to crush the power of the Marathas. His son Akbar fled to Persia, and there died, but a desultory and undecisive warfare was carried on with the Marathas for years. In 1686 Aurangzib captured Bijapur, and in the following year Golconda, and added these two kingdoms to his Empire. During the sieges his army was much harassed by contingents of Maratha troops, but Sambhaji, who now chiefly devoted his life to sensual pleasures, lost the opportunity which the grave difficulties of the Imperial army afforded, and made no attempt to save either city. In 1689 Sambhaji was captured, when he was drunk and entirely off his guard, by a body of the Imperial troops at Sangameshwar. So odious had he become to his own people that no attempt was made to rescue him, and he and the few taken with him were led into the Imperial camp mounted on camels, bareheaded, and preceded by discordant music. Aurangzib offered Sambhaji his life on condition of his becoming a Muslim, to which Sambhaji replied that he would accept Islam if Aurangzib would give him his daughter, and concluded by cursing the Arabian prophet. For this offence he was blinded with a red-hot iron, his tongue was cut out, and he was beheaded. The Maratha people, though long estranged from him, heard of the cruel death of the son of Shivaji with indignation. Shortly after his death the Imperial troops besieged and took Raygarh, and captured his widow and his infant son Shivaji. The boy was brought up in the Imperial camp and was given by Aurangzib, who treated him kindly, the nickname of Sahu, and the nominal command of 7,000 horse. Meanwhile Rajaram, the second son of the great Shivaji, had been declared regent for the boy Sahu, or Shao, as he was called by the Marathas. It was soon discovered that Maharashtra was no safe country for him, and he retired to Jinji, the great fortress on the Coromandel

coast, in the Carnatic dominions of the Marathas. Here he was enthroned as Maraharaja, it being evident that Aurangzib had no intention of releasing Shao, and an Imperial army under Zu'l-fiqar Khan was sent to besiege Jinji. The army was not strong enough to invest the place, but after a time Zu'l-fiqar, by means of a bribe and a promise to connive at his escape, persuaded Rajaram to allow him to enter the fortress, which was, according to the official account, "carried by escalade." Rajaram returned to Maharashtra, and made Satara his headquarters. He died at Sinhgarh in March, 1700, and Satara was taken by Aurangzib in the following month. His young son Shivaji was acknowledged by the Maratha chiefs as their sovereign, and the reins of government were seized by the child's mother, Tarabai, an able and ambitious woman, under whom the Marathas extended the range of their aggressions, plundering Surat, Burhanpur, Malwa, and Gujarat. They refrained from plunder when their demands for the levy of *chauth*, *sardeshmukhi*, and *ghas-dana* were acceded to, but the discipline of their troops was no longer what it had been under the great Shivaji. "When the horse took the field, stragglers were allowed to join, plunder was secreted, women followers, who had been prohibited on pain of death, were not only permitted, but women were brought off from the enemy's country as an established article of plunder, and either retained as concubines or sold as slaves." The first object of the Maratha hordes was now plunder, and they were far more destructive to a country than the organised and comparatively well-disciplined troops of Shivaji had been. Acting under the orders of Tarabai the Maratha forces recovered many of the forts which the Imperial troops had captured, their task being facilitated by the character of those opposed to them. Few of the Imperial officers displayed any character or energy. "Public virtue was unknown amongst them, and they were corrupt, slothful, and indifferent. One cause of this general debasement was the great age and increasing infirmities of the Emperor and the character of his sons." Thus a force sent by the Emperor to reduce Sinhgarh, Shivaji's first fortress capital, suffered a humiliating defeat, the news of which was almost the last news which the aged Emperor received, for early in 1707 he breathed his last at Ahmadnagar. "Every plan that he had formed came to little good, every enterprise failed." His death was followed by the usual fratricidal contest for the throne, of which the Marathas took full advantage, and which ended in the triumph of his eldest surviving son Mu'azzam, or Shah Alam, who assumed the title of Bahadur Shah. This politic monarch, by releasing Sahu, or Shao, and acknowledging him as Maharaja, divided the Marathas into two factions, one accepting Shao as King, and the other, headed by Tarabai, who denounced Shao as an imposter, adhering to the young Shivaji. They may be described as the Satara and the Kolhapur parties, Shao taking up his residence at Satara, and Tarabai and Shivaji occupying Kolhapur. In 1712, Shivaji, who was an idiot, died of smallpox, and Tarabai was removed from the regency, but the Kolhapur party, instead of healing the breach, adopted as their ruler Sambhaji, the second

son of Rajaram. In this year the Emperor Bahadur Shah died also, and again the Marathas profited by the contest for the throne carried on by his sons.

Shao had been gradually succumbing to habits of sloth, and he now, by violating two of the fundamental principles of his grandfather's system of government, "forged the first link in the chain which afterwards fettered his own power, and reduced his successors to empty pageants of Brahman policy." He appointed Balaji Vishvanath, an astute and most able Konkanasth Brahman, hereditary Peshwa, and bestowed on him, as a fief, the fortress of Purandhar. Some time after this, Shao, overcome by a domestic bereavement, lost his reason, and though he recovered it before his death, all business of state was carried on by the Peshwa, and thus was established the power of the Peshwas as *de facto* leaders of the Maratha confederacy.

The substitution of Brahman for Maratha rule was a movement towards efficiency, for administrative ability was rare among the Marathas, and Shivaji was one of the few great administrators whom they have produced, but it tended towards disunion, for the Maratha chiefs were intensely jealous of Brahman dominance, and not long after this time, on the occasion of the invasion of India by Nadir Shah of Persia, Raghuji Bhonslé, the most powerful of the military leaders, was in open rebellion against the Peshwa.

Maratha influence now made itself felt in the Imperial capital. There were two great parties at court, the Hindustanis, consisting of Muslim families long domiciled in India, and the Turanis, consisting of adventurers from Transoxiana, the original home of the Imperial family, and their immediate descendants. The native party resented the predominance of the foreigners, and the more extreme among them were disposed to regard even the Imperial family as alien intruders. The leaders of this party were two brothers of the well-known clan of the Barha Sayyids, and were known as the Sayyid Brothers. Their influence at court was for some time supreme, and they set up and pulled down one puppet emperor after another. They favoured the Marathas, as a truly native power, and made considerable concessions to them. Muhammad Shah, shortly after his accession in 1719 overthrew the dictators, but confirmed their concessions to the Marathas, recognised Shao as their ruler, and admitted his claim to levy both *chaauth* and *sardeshmukhi* throughout the Deccan. Balaji Vishvanath calculated these levies on the land revenue demand as fixed in the most prosperous days of the Empire, knowing that they could not be raised at these rates from a ruined country, and thus always had a bill for arrears due to form the basis of new bargains. He died in 1720, and was succeeded by his son Baji Rao, who was most ably assisted by his younger brother Chimnaji Appa. It was with his help that he re-organised the army, which, under Sambhaji, had become an undisciplined and predatory mob, and it was during this re-organisation of the army that the ancestors of the great Maratha chiefs so well known to us by their surnames, Gaekwar of Baroda, Sindhya of Gwalior, Holkar of Indore, and Bhonslé of Nagpur, first became prominent.

In 1724 Asaf Jah Nizam-ul-Mulk, ancestor of the present Nizam of Hyderabad, made himself virtually independent in the Deccan, thus enabling the astute Peshwa to play him off against the Emperor.

The policy which Baji Rao had inherited from his father, and which he followed as far as possible, was rather the extension of the area of his demands for *chauth*, *sardeshmukhi*, and *ghas-dana* than territorial expansion. These levies, which I have more than once mentioned, were humiliating exactions. The first was one quarter of the land revenue, and was blackmail for the abstention of the Marathas from plundering and for their protection of the land from other plunderers. The second, ten per cent. on the gross revenue, had its origin in Shivaji's claim to be the chief *deshmukh*, or hereditary collector of revenue in certain districts of the Deccan, but was demanded wherever *chauth* was demanded. The third, which means "grass and grain," or "fodder," was a vague demand for fodder for any force engaged in enforcing the other two demands. Balaji had astutely arranged that several Maratha chiefs should share the collection of these dues from a single district, "thus purposely complicating the accounts and increasing the power of the Brahmans, who alone had the knowledge and intelligence equal to dealing with such accounts. They alone knew what was due or to whom it was due."

Meanwhile, the Marathas over-ran Gujarat, Malwa, and Bundelkhand, and in 1737 evaded the Imperial army and appeared before the gates of Delhi. They did not attempt to enter the capital, and were recalled to the Deccan by the aggressions of Nizam-ul-Mulk. He was defeated, and was compelled to cede to them the government of Malwa, which he had hitherto held and exercised by deputy, but before they could occupy their newly-acquired territory India was invaded by Nadir Shah of Persia. The capture of Delhi, and the rumour that a Persian force was about to advance southward aroused the Peshwa's fear, and he wrote to his brother Chimnaji, then engaged in the Konkan in a campaign against the Portuguese, "Our domestic quarrel with Raghuji Bhonslé is now insignificant, the war with the Portuguese is nought; there is now but one enemy in Hindustan. Hindus and Musalmans, the whole power of the Deccan must assemble, and I shall spread our Marathas from the Narbada to the Chambal." But the danger passed. The invader withdrew, leaving his humbled opponent in possession of India to the east of the Indus, and censuring the Marathas for not having hastened in time to the aid of their sovereign.

Raghuji Bhonslé was ostensibly reconciled to Baji Rao, but on his death in 1740 he vigorously, though unsuccessfully, opposed the acknowledgment of his son Balaji as Peshwa. The second Balaji lacked the energy and the ability of his father and his grandfather, but his deficiency was supplied by the loyal help of his cousin Sadashiva Rao Bhau, the son of Chimnaji Appa.

The Marathas now invaded Bengal and Bihar, and the Peshwa received the government of Malwa, nominally as the deputy of the Emperor's young son, Ahmad, who succeeded his father in 1748, but in 1750 was confronted with a

grave difficulty, caused by the death of the Maharaja Shao, who had left no son. Balaji would gladly have usurped the throne, but he knew that the Maratha chiefs would not acknowledge him, and his installation of a puppet, in the person of Shao's cousin, Ram Raja, was so obviously calculated to perpetuate his own leadership, that he was obliged to conciliate the great chiefs with large grants in order to induce them to acknowledge his virtual sovereignty of the league.

Meanwhile, the Marathas continued to extend their influence in the north. Ajmer was over-run, and both the Rajputs and the Jats were obliged to contribute to the Maratha treasuries. Sindhya and Holkar played a leading part in the tortuous politics of Delhi, and in the deposition in 1754 of the Emperor Ahmad Shah, and the enthronement of his cousin, Alamgir II, who was succeeded in 1759 by Shah Alam. In 1760 war broke out in the Deccan, and the Nizam, Salabat Jang, and his brother, Nizam Ali, were defeated by Sadashiva Rao Bhau. The nation appeared to be on the point of attaining the supremacy of which the great Shivaji had dreamed, when suddenly its hopes were dashed to the ground.

After the death of Nadir Shah of Persia, his great empire broke up, and one of his leading generals, Ahmad Khan, of the Abdali tribe of Afghans, established his independence, assumed the royal title, and founded the modern State of Afghanistan. He had already invaded the moribund empire of India and exercised some control over its domestic politics, but in 1760, enraged by the predominance of the Maratha misbelievers, he again invaded the land, with the avowed object of crushing their power.

The Peshwa's son, Vishvas Rao, and Sadashiva Rao Bhau hastened from the Deccan with their Maratha troops and a contingent under a Muslim mercenary, Ibrahim Khan Gardi. They were joined by Malhar Rao Holkar, Jankoji Sindhya, Damaji Gaekwar, and many minor chiefs, and, after much wrangling as to the tactics to be adopted, marched out to the historic field of Panipat to meet the invader. Entrenching themselves they at first attempted to wear him out by cutting off his supplies, but in this they found that the Afghans excelled them, and, reduced to the greatest distress, they were compelled, on January 7th, 1761, to move out of their camp and attack the enemy. They were defeated with great slaughter. Gaekwar and Holkar contrived to escape, but Vishvas Rao, Sadashiva Rao Bhau, and most of the principal officers were slain, and the greater part of the Maratha host was cut to pieces. Sindhya and Ibrahim Khan were captured and were put to death after the battle, and a courier bore to the Peshwa a dispatch in the following words:—"Two pearls have been dissolved, twenty-seven gold *muhrs* have been lost, and of the silver and copper the sum cannot be cast up." He understood the message and never recovered the shock, but died six months later.

I close with this battle, although the Maratha nation survived it. While it was recovering, another Power was rising in India, which barred the way to the realisation of Shivaji's dream. With this Power the Maratha nation waged four

wars, but there still remain as honoured feudatories of the King-Emperor, the Maharajas of Baroda, Gwalior, and Indore.

THE CHAIRMAN said that it was not customary in the case of the Sir George Birdwood lecture to have any discussion, and it rested only with the Chairman to propose a vote of thanks to the lecturer. It was very interesting to have heard a lecture delivered with such authority. For an hour Sir Wolsley had poured into the ears of his audience many names familiar and unfamiliar, very charming names some of them—personally he could think of no more beautiful name than Shivaji, which was a good enough name for any man—or any horse. It had occurred to him that it would be very difficult to account for the failure of the Marathas to occupy Northern India. It was a curious circumstance that had prevented one race after another from completing the whole conquest, until the British devised a beautiful scheme of getting other people to help them in ruling the country. Turning to the map of India, which was exhibited at the meeting, the Chairman said that one came away from any study of India such as had been presented that afternoon with a feeling of the immensity of the country and of the great stage of action which it offered for the play of innumerable tragedies and comedies. He was sure the Society was most grateful to Sir Wolsley Haig for this entertaining and instructive lecture.

DR. RAGHUNATH PURUSHOTTAM PARANJPYE, M.A., D.Sc. (Member of the India Council), in seconding the vote of thanks to the lecturer, said that Sir Wolsley Haig had given a wonderful story of the earlier days of the Maratha nation. This was not the occasion for questioning any of the statements he had made, but he did wish just to say that no Maratha would accept the charge brought against Shivaji that he treacherously assassinated Afzal Khan. He thought that the Maratha people had been unfortunate to a certain extent in regard to their historians. Just as, for example, what we knew of the Carthaginians depended upon Roman historians, so the history of the Marathas had been compiled from what was written or bequeathed by the Muhammadans. Everything that was said against the Marathas by the Moslem chroniclers was formerly taken as true, but during the last 40 or 50 years certain original documents written by Marathas had come to light and had been published in large quantities. If these sources were examined by impartial foreigners, as they had been examined to a great extent by Kincaid and his collaborator, it would be found that several of the charges brought against Shivaji were unfounded. No Maratha, at all events, would in any case accept the view that he was guilty of assassination. He believed the fact was that Afzal Khan asked Shivaji for an interview. Afzal Khan was almost twice as big as Shivaji, and the latter knew that there was a possibility of treachery, and so came prepared. On meeting they embraced, and in the embrace Afzal Khan tried to strangle Shivaji by his immense personal strength. Shivaji was astute, however, and having come prepared for any eventuality, he managed to stab Afzal Khan. The first act of treachery, however, was committed by Afzal Khan himself. That was, at any rate, the story that the Marathas believed. They never would credit the story current among historical writers that Shivaji was guilty of assassination. That was a thing which no Maratha could allow to pass unchallenged.

He was very glad indeed to have heard a lecture delivered in so charming a manner, and giving an interesting sketch of the history of the Marathas which

was not generally known to outsiders. After all, the Marathas in the 17th and 18th centuries were perhaps the most important and influential people in India. It was certain that the British had to fight their most severe battles against the Marathas rather than against any other people. The only other serious wars that the British had to wage were with the Sikhs in the North and Hyder and Tippoo in the South.

The speaker mentioned that he himself belonged to the Maratha nation. He came from a part of India where every place and every stone was eloquent of old Maratha history, and it was with a great feeling of pride and also of thankfulness that he had heard the lecturer deliver this story of Maratha history, not only in so charming a way, but also in a way which showed the Marathas in a true perspective and setting.

The vote of thanks having been put from the Chair and passed unanimously, the meeting terminated.

EXHIBITION OF HAND PRINTED MATERIALS

EXHIBITION OF HAND BLOCK PRINTED STUFFS by Enid Marx. At the Little Gallery, 5 Ellis Street, Sloane Street.

Though Miss Marx's show is officially closing the day after this review appears, it will still be possible to see specimens of her admirable work at the Little Gallery thereafter.

Miss Marx has not had a one woman show before, but her exhibits at the Arts and Crafts Exhibition Society's Show last year, and at the Mansard Gallery on various occasions have already attracted a good deal of attention. Thus a prominent British firm has invited her to send in designs, and a German firm has actually employed her.

Miss Marx was lucky enough to have Miss Phyllis Barron for her teacher. She has Miss Barron's technical proficiency, and her own sense of design. Somehow she manages to combine forms that are essentially in the modern spirit with large harmonies that have the most agreeable traditional suavity; one might say that her detail is twentieth century, her general composition broadly classical.

Some of her cottons, printed with simple spot patterns, are obviously the thing for summer dresses. She also shows some delightful glazed chintzes which might do very well for the same purpose. Her linen bed-spreads give her scope for more ambitious designs; so do her curtains and table-cloths. She has sought and found opportunities for treating Kashmir and velvet in the same useful ways as the more common materials; her sense of the appropriate is always above criticism.

The small group of designers to which Miss Marx belongs have a definite niche in our contemporary artistic fabric, and one wishes their prosperity as much as one desires their products.

NOTES ON BOOKS

THE APPLICATION OF SCIENCE TO CROP-PRODUCTION. By A. & G. L. C. Howard. Oxford University Press. London: Humphrey Milford. 9s.

The title of this book suggests that a far wider sphere is covered than is actually the case, but the sub-title of "An Experiment carried out at the Institute of Plant Industry, Indore," is more explanatory. The book is, in fact, an account of the

inception, organisation and progress during the first five years of the Institute, which was established at Indore in 1924, under the directorship of the author, for the study of cotton-growing problems in Central India. The justification for the title lies in the argument developed throughout the book that the usual method of "organisation of a research institute, on the basis of practical agriculture on the one hand, and of the separate sciences on the other, is by no means the ideal arrangement." It is maintained that the splitting up of the problems into a number of parts, some of which are dealt with by stations created for studying only the practical problems met with in the field, while the others, of a more fundamental nature, are considered to be the province of institutions of pure research, is essentially unsound, and leads only to overlapping and to failure to make the best use of the information discovered. The Institute of Plant Industry at Indore was founded with the idea of studying the crop as a biological whole and of creating improved methods of disseminating the knowledge acquired to the actual growers. The intention is very laudable and the results obtained are undoubtedly excellent, but it is a little difficult to see that the method is so entirely original as is claimed for it. One need only point to such institutions as the Long Ashton Research Station and many others in England and to the Tea and Rubber Research Institutes in the East, where the study of the crop along these lines is surely as complete.

That cotton-growing in India might be improved enormously is a fact beyond dispute. The acreage under cotton cultivation in India is only one-third less than that in the United States, yet the crop is only one-third as large owing to the very low yields obtained. These low yields are due to a great number of causes, of which one of the most important is the poor methods of agriculture in use, a problem to which the new Institute is devoting a great deal of its attention.

Chapters I and II of the book deal with the foundation of the Institute, the planning of buildings and lay-out of the experimental area. Full details are given for the benefit of workers and administrators in other parts of the Empire. Particular attention has been paid to the grading of the surface of the fields, and to the provision of suitable drainage in order to prevent so far as is possible the loss due to that great enemy of tropical agriculture, soil erosion.

In Chapter III the investigations on improvement of cotton varieties by selection are recounted. Several improved strains suitable for the different areas and methods of cultivation have been obtained, and are eagerly sought after by cultivators. The next two chapters are concerned with improvement in the agronomy of cotton and other general agricultural problems. Considerable advances have been made by the development of a practical and economical method of eradication of one of the greatest weed-pests of Central India, the wild sugar-cane, and by the utilisation and improvement of the Chinese method of preparation of an artificial manure, suitable for the black soils, from waste vegetable produce.

Undoubtedly one of the means by which the Institute will prove of the greatest value is in the facilities provided for a training of all kinds in cotton agronomy. Arrangements are made not only for the training of post-graduate science students, but also for the teaching of workmen and cultivators how to grow their cotton to the best advantage.

An unexplained omission in the programme of investigations cannot pass unnoticed. No reference at all is made to the problem of diseases and pests of cotton, and it is difficult to see why so important a factor should have been left out of account. It is true that India is fortunate in having less trouble from this source than most other cotton-growing countries, but to mention one disease alone, the widespread "wilt-disease" takes a heavy annual toll in many parts.

R. H. STOUGHTON.

SPEECH AND HEARING. By Harvey Fletcher. London: Macmillan and Co., Ltd.
21s. net.

Due to the growing importance of its technical applications in everyday life, acoustics is rapidly advancing from its former position as the Cinderella of the sciences and attracting the attention of an increasing number of investigators. For example, certain problems of telephone engineering require for their solution an accurate knowledge of the fundamental facts concerning speech and hearing, and, in consequence, workers in the Bell Telephone System Laboratories have for some years past been engaged on important researches in physiological acoustics. The results of these researches, published in memoirs scattered in many journals, have been assembled by Dr. Fletcher, the Acoustical Research Director, to form the present connected, authoritative, and welcome treatise. The matter described is essentially modern and, with the exception of an account of Helmholtz's theory of audition, work published prior to, say, 1905, is dismissed in less than half-a-dozen pages. This appears justified in view of the revolution in the technique of experimentation, and the corresponding increase in accuracy, brought about by the development of the thermionic valve and electric filters.

The book is divided into four parts treating speech, music and noise, hearing, and the perception of speech and music respectively. Mathematical work is relegated to a series of six short appendices.

The first section deals with the mechanism of speaking, speech waves (a number of which are reproduced), speech power (estimated in "bels" and "decibels"), and the frequency of occurrence of the different speech sounds. While mention is made of Sir Richard Paget's apparatus for artificially producing vowel sounds no reference is given to either this work or the similar (and unmentioned) work of Crandell, published in 1927. This lack of references is characteristic of the book—the value of which would be increased by the provision of an adequate bibliography.

The section on music and noise is concerned with the acoustic spectra of some typical musical instruments obtained by Wegel and Moore's electrical frequency analyser, and the methods and results of noise surveys.

Dr. Fletcher advocates what is essentially the Helmholtz theory of audition, but he has modified it to accord with the results of modern physiological research. Particularly interesting sections deal with the estimation of the characteristic frequency regions and the calculation of the form of vibration of the basilar membrane. An important chapter on the methods of testing acuity of hearing is to be commended in particular to educationalists. So far as the writer is aware, no systematic examination of the hearing of school children is undertaken in this country or any effort made to ameliorate the lot of the slightly defective, although optical examinations are commonplace.

In the final section, on the perception of speech and music, Dr. Fletcher describes his well-known work on the physical criterion for determining the pitch of a musical tone, and considers the effects of various forms of distortion on the recognition of sounds.

The book is well produced and illustrated, and, with the exception of one or two minor slips in spacing on p. 290, is admirably printed. The price, considering the amount of matter reported and the lamentable cost of text books in these days, is not excessive. It may be recommended not only to the physicist, but also to the phonetician and physiologist.

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No. 4050

FRIDAY, JULY 4th, 1930

VOL. LXXVIII

All Communications for the Society should be addressed to the Secretary, John Street, Adelphi, W.C.2.

NEWS OF THE WEEK

"The nation in every country dwells in the cottage ; and unless the light of your Constitution can shine there, unless the beauty of your legislation and the excellence of your statesmanship are impressed there on the feelings and conditions of the people, rely upon it, you have yet to learn the duties of government."

John Bright.

Theatres.--BADGER'S GREEN, AT THE PRINCE OF WALES.—No one interested in the Preservation of Rural England should miss this play. If there is any sincerity in the propaganda to stop the spread of undesirable forms of building and all the hideous and untidy methods of giving the motorist his requirements of food and oil, this play should be subsidised by the various Societies until it is known and appreciated. There is every evidence that if it can hold its own for a few weeks it might have a long enough run to justify its existence as a delightful comedy of the absurdities of English village life. The author has missed entirely the propaganda side although one suspects his intentions were to state the case for educated control with insistence. The charm of the play is its atmosphere and if it excites a real and intelligent controversy regarding the real problem of Preservation the stage will have done a great service to a cause which is of such pressing urgency.

The play begins with its comedy of petty village jealousies which so absorbs their minds that a proposal from London to take their village in hand and develop it seemed overwhelming in its significance. The perfect English gentleman with his ladylike secretary who arrives to take the matter in hand is hardly true to type. The inn-keeper, on the other hand, who sees in an increase of residents, an increase of visitors and vast possibilities of business, and his notions of the requirements of a modern hotel, are delightfully realistic. The stage was set for a village run by a

family doctor, a pompous major, and a brainless and disillusioned stockbroker. Probably these are fairly representative of all that remains of the more feudal type hitherto associated with English village life. The Squire has gone, and with him the control that kept the surroundings of our villages inviolate. Mr. Sheriff would no doubt resent the suggestion that he wrote this play except as a comedy of English rural life, but his characters suggest problems that he might well have carried to some useful solution.

A pernicious idea prevails that beauty has something to do with age and that bungalows and ugliness are necessary evils involved in moving with the times. But what can be expected from the inhabitants of our restless and disordered towns when they push out into rural conditions? No societies have the power to stop the enterprising land agent from acquiring land and parcelling it out to his own advantage, and handing it over to the speculative builder to erect thereon the sort of meretricious house that appeals to uneducated people.

The authors and producers of "Badger's Green" are generously giving a special matinee performance on Wednesday, July 9th, in aid of the funds of the Council for the Preservation of Rural England and the Commons and Footpaths Preservation Society. All seats can be booked and it is hoped that a large number of people will take this opportunity of seeing an admirable play and at the same time helping the cause of rural preservation.

NOTICE

PRESSENTATION OF THE SOCIETY'S ALBERT MEDAL

The Council of the Royal Society of Arts attended at Clarence House on June 26th when H.R.H. the Duke of Connaught, President of the Society, presented the Albert Medal for 1930 to Professor Henry E. Armstrong, F.R.S., "for his discoveries in Chemistry and his services to Education."

Lt.-Col. Sir Malcolm Murray, K.C.V.O., C.B., C.I.E., was in attendance upon His Royal Highness.

The Members of the Council present were:—Dr. Edward F. Armstrong, D.Sc., F.R.S., the Rt. Hon. Lord Askwith, K.C.B., K.C., D.C.L., Capt. Sir Arthur Clarke, K.B.E., Mr. Peter M. Evans, M.A., LL.D., Sir Edward Gait, K.C.S.I., C.I.E., Sir Robert Hadfield, Bt., F.R.S., Rear-Admiral James de C. Hamilton, M.V.O., Major Sir Humphrey Leggett, D.S.O., Sir Philip Magnus, Bt., Mr. J. A. Milne, C.B.E., and Sir Richard Redmayne, K.C.B., with Mr. G. K. Menzies (Secretary of the Society).

On receiving the medal Professor Armstrong said:—

"In thanking your Royal Highness and the Council of the Royal Society of Arts for the honour conferred upon me by the award of the Albert Medal, I find a

difficulty in sufficiently expressing the gratification I feel not only in receiving it but especially, Sir, in receiving it from your hands, from the son of the great man in whose memory the foundation is established. I have long revered his name. Although not born under the shadow of the 1851 Exhibition, which His Royal Highness your Father and the Society of Arts, of which he was Chairman at the time, did so much to promote—we are both its seniors—I have lived under its shadow all my life since it was re-erected at the Crystal Palace, at Sydenham, a marvellously stable structure of iron and glass. I spent many happy hours there and learnt much there in my youth.

His Royal Highness Prince Albert early became one of my heroes. I gained my first experience as a chemist under the great Hofmann, in the Royal College of Chemistry, Oxford Street, translated in 1870 to South Kensington. The College was established in 1845 largely owing to his Royal Highness's efforts; in particular, he was instrumental in securing Hofmann as its first Professor. The College came into being on the top of a wave of enthusiasm raised by Liebig in a triumphal tour throughout England, in which he was personally conducted by Lyon Playfair. Liebig's theme was the application of scientific method to agriculture—we are still far from having carried out his behests. Hofmann, I may mention, was the scientific father of Perkin, the discoverer of the first aniline dyestuff; also of the late Sir William Crookes, the founder of modern electro-physics.

The world has yet to appreciate the greatness of the work done by his Royal Highness in establishing the Commission for the 1851 Exhibition, since continued on a broader basis, as the guardian of the Research Scholarship scheme originated by the late Lord Playfair.

He was also concerned in the erection of the great Art Museum at South Kensington and in the establishment of the Science and Art Department, long the leading agency of instruction in elementary Science and Art throughout the country. His work is to-day reflected in all the Scientific Institutions at South Kensington.

I am also specially gratified to receive this recognition from you as President of the Royal Society of Arts. Fifty years ago last year, at about this time, I received a letter from the then Secretary of the Society, the late Sir Henry Trueman Wood, telling me that the late Professor Ayrton and I had been appointed by the City and Guilds Institute for Technical Education as their first Professors. We established the Finsbury Technical College upon original lines and were the first workers in the great technical education movement which was soon to extend over London and England generally. Our work was entirely of a kind that His Royal Highness Prince Albert would have appreciated. I am the first member of the body of teachers who took part in that work to receive public recognition and it is not merely on my own behalf that I tender to your Royal Highness my thanks to-day. The Royal Society of Arts is so broad in its constitution, so catholic and sympathetic in its operations, that the seal of its approval must rank very high. Among the recipients of the medal are not a few chemists, beginning with Faraday and Liebig and ending with Madame Curie and Sabatier. To be placed with such as these is, indeed, a distinction."

TEMPLE BAR

(From a Correspondent)

"Temple Bar is a very handsome gate, where anciently were only posts, rails, and a chain, such as are now at Holbourn, Smithfield, and Whitechapel-bars. Afterwards a house of timber was erected across the street, with a narrow gateway, and an entry through the south side of it. But since the fire of London, the present structure was erected; and is the only gate at the extremity of the city liberties."

So Dodsley's *London* in 1761; but neither Dodsley nor, apparently, any other eighteenth century historian explains why Temple Bar should have been, to continue our quotation, "particularly distinguished by having the heads of such as have been executed for high treason placed upon it." The monstrous practice had not even the poor excuse of antiquity.

Temple Bar was designed by Wren, built by Marshall, decorated by Bushnell; the collaboration is not a little interesting. A noble entrance to the City, at the point where the King of England had to halt and ask leave to enter, was a part of Wren's vision of a new and greater London, and his choice of Joshua Marshall, thrice Master of the Masons' Company and a very notable sculptor, was thoroughly justified. The Marshalls, father and son, had been connected with Fleet Street since the reign of James I, though Joshua's most familiar work, the pedestal of Charles I at Charing Cross, was not yet erected. Such details as the treatment of the volutes and the wreathed tablet in the pediment recall those found, sculptured with greater delicacy, on many of the monuments that bear the name of father and son.

John Bushnell was the obvious sculptor for the statues. He was in favour at Court, and had given the world a taste of his quality in those surprising figures of Charles I, Charles II and Gresham from the second Royal Exchange, which are now in the New Bailey. But if Vertue is right in calling the Temple Bar figures "the first works he did publick," he must be referring to the date of the commission, and not its completion, since the Exchange statues were up in 1671, and Temple Bar was only finished in 1672. Bushnell received £130 or £150 for each, a very high price for the period; but we cannot agree with Horace Walpole in thinking them his best.

On the side of Temple Bar facing the road stand the dramatic forms of Elizabeth and James I, the former an idealised figure of the Virgin Queen, such as that made by Nicholas Stone in 1625, which may be seen at the Guildhall to-day. So unlike are both these statues to the portraits that their identity has been fiercely disputed, though the sceptre in the hands, the Phoenix once below the one, and the ballad of 1684 which names the other, should have long since settled the question in favour of the ruling sovereign, not a mere Queen Consort. To the James I, Bushnell at least concedes a ruff and doublet, but like the Charles I and II on the inner side, his draperies are as those of angels on the Ponte S. Angelo, the trick of which Bushnell had learnt during his two years in Bernini's Rome.



Entrance into the Temple and Temple Bar

But Temple Bar is more than a monument at once original and dignified, the result of the harmonious collaboration of a great man with two notable colleagues ; it is steeped in English history and English blood. The first man executed for treason whose remains were subsequently exposed upon Temple Bar was Sir Thomas Armstrong, who was implicated in the Rye House Plot. Under William III the limbs of the Jacobites Sir William Perkins and Sir John Friend were placed there in 1696 ; and on May 17th, 1723, the head of Christopher Layer, the would-be Chancellor of James III, was placed upon a stake above it for some twenty years. It was then blown down in a gale and picked up by a " distinguished attorney," Mr. John Pearce of Tooke Court, from whom it was bought by Dr. Richard Rawlinson, the Oxford antiquary and benefactor. By his will he was buried with it in his hand, a fact little realised by most of those who worship at St. Giles' ; let us hope that the vile tradition, relegated by Nichols to a footnote, that the original head was buried under the floor of a public house in the neighbourhood, and another palmed off upon the antiquary, is untrue.

But it is the sufferers of the '45, whose names are imperishably connected with Temple Bar, the old hero Balmerino, as Horace Walpole called him, Kilmarnock, " pitied by gentle hearts," and Lovat, The Old Fox. Another nobleman, George, Earl of Winton, was to have made a fourth in the sad company, but, though condemned to the same fate on March 19th, 1746, he cut through the bars of his prison window in the Tower, and escaped to France. But theirs were not, it

seems, the only heads, though three alone are shown in the familiar plate in Dodsley. On Saturday, August 2nd, 1746, "the heads of *Townley* and *Fletcher*," says Sylvanus Urban, "were fixed on Temple Bar, and those of *Chadwick*, *Deacon* and *Syddal* were preserved in spirits to be carry'd to *Manchester*, and there set up in the proper places." Francis Townley, of the well-known Lancashire family, was a colonel in Charles Edward's army; George Fletcher, who "had the character of a very honest young man," an ex-linen draper turned captain, like Chadwick, Deacon and Syddal, in the Manchester regiment along with poor Jenny Dawson—hence the ghastly preservation of their heads in spirit to be sent to Manchester. Yet another head, that of the lawyer David Morgan, was to have been set up on Temple Bar, but for some reason this was countermanded. On these heads it was that Dr. Johnson gazed while Goldsmith murmured the quotation just prophetically used by Johnson in the Abbey, "*Forsitan et nostrum nomen miscebitur ISTIS*"; it was the last of all that dreadful group that Samuel Rogers, dead in December, 1855, remembered in his youth.

And this Gate of Memories has been sold once, and is again for sale.

PROCEEDINGS OF THE SOCIETY

ANNUAL GENERAL MEETING

The One Hundred and Seventy-sixth Annual General Meeting, for the purpose of receiving the Council's Report and the Financial Statement for 1929, for the election of Officers, and to consider the sale of ground rents at Clapton, was held in accordance with the Bye-Laws, on Wednesday, 25th June, at 4 p.m.

In the absence in Berlin of Mr. Llewelyn B. Atkinson, Chairman of the Council, the RT. HON. LORD ASKWITH, K.C.B., K.C., D.C.L., late Chairman of the Council, was unanimously elected to the Chair.

THE SECRETARY read the notice convening the meeting and the Minutes of the last Annual General Meeting, held on June 26th, 1929.

THE SECRETARY then read the following :—

REPORT OF COUNCIL

I.—ORDINARY MEETINGS

MR. LLEWELYN B. ATKINSON, Chairman of the Council, chose for the subject of his inaugural address "Fifty Years of Electrical Science and Industry." After describing the principal inventions that have made possible the enormous development in the use of electricity during the last half-century, the Chairman exhibited a number of graphs which gave striking evidence of the extent of this develop-

ment. For instance, the number of telephones in Great Britain rose from a few thousands in 1890 to nearly two million in 1930; the capacity of generating plant in England rose from less than two million kilowatts in 1907 to nine million kilowatts in 1927, while the capital expenditure on electricity supply rose from forty million pounds in 1903 to nearly three hundred millions in 1928. Most of the earlier discoveries and applications of electricity were first presented to the public at the Royal Society of Arts, and the Chairman printed, as an appendix to his address, a list of the lectures and papers on these subjects given before the Society between 1876 and 1891 which bore out his statement.

"New Developments in Hydraulic Pneumatic Engineering" was the title of a paper in which MR. J. O. BOVING described a system of raising water in a pump by introducing bubbles. Although the Hydraulomat has been in existence for some time, it is only quite recently that in a modified form it has been adapted for work on a large commercial scale. To Mr. Boving is due the credit for a large amount of research in such points as determining the optimum size of the bubbles, etc., and his work has been so fruitful that important plants have been installed on the irrigation canals in India, in Nigeria and elsewhere. A full account was given of the machinery and its method of working. Not only has the plant proved remarkably successful, but it has the additional advantages of being extremely economical to erect and to operate.

New applications are constantly being devised for Röntgen's remarkable discovery, and one of the most recent was described by MR. C. NORMAN KEMP, who delivered the Dr. Mann Lecture on "The Examination of Coal and Coke by X-Rays." By means of comparatively inexpensive and simple apparatus it is now possible to see into the structure and composition of a block of coal, and to estimate its composition by merely taking an X-ray photograph. The importance of "clean coal" was clearly demonstrated by Dr. R. Lessing in the course of Cantor Lectures which he delivered in 1925, and by means of X-rays the proportion of ash in a sample of coal is easily shown. A new feature has been introduced into fuel technology, and one which may prove to be of great value in showing whether coal is really clean or not.

MR. HARRY H. PEACH has for some years been occupied in organising exhibitions to show how the country is suffering from unsightly advertisements. The series of slides with which he illustrated his paper, "The Advertiser and the Disfigurement of Town and Countryside," must have convinced any in his audience who were not yet of his opinion of the full horrors of the evil. It is hardly necessary to say that a poster may be a delight, but even the best of them suffer if it is not displayed properly. Mr. Peach pleaded especially for tidiness in place of the horrible hotch potches that so often disfigure our hoardings, and he quoted in particular the example of Zurich, where advertisements may only be shown in an orderly manner and where they are consequently enabled to perform their function with the maximum efficiency. The parts played by enamel signs and by fly-posting in defiling the face of the country also received their dues from Mr. Peach.

Probably at no period in our history has there been so much unnecessary destruction of what is beautiful in England as at the present day. In his paper "Urban and Rural Amenities," MR. P. MORLEY HORDER dealt first with some of the trouble that is now going on in London. The whole scale of Park Lane, for instance, has already been altered, and it is possible that the new scale will be destroyed, almost before it has been established, by the mammoth building that is to take the place of Dorchester House. The unity and homogeneity of Regent Street and Portland Place have been sacrificed, and many other districts are threatened. In the country the situation is, if possible, even worse. Attention was drawn, in particular, to the recent destruction of Nuthall Temple, near Nottingham, and Newcastle House, Lewes, both beautiful buildings which could ill be spared. The Royal Society of Arts is doing what it can to preserve some of our village charms, and slides were shown illustrating what it has done or is now doing at West Tarring, Sussex; Arlington Row, Bibury; Smarden, Kent, and in particular at West Wycombe, Buckinghamshire.

As late Chief Automobile Engineer to the General Post Office, with a fleet of 3,000 motor vehicles under his charge, MAJOR C. WHEELER was peculiarly fitted to deal with the subject of his paper, "Overheads and other Factors influencing Road Transport Costs." He insisted on the supreme importance of keeping minute costing accounts. In the case of many items, *e.g.*, fuel, oil and wages, this is a comparatively simple task, but there are others, such as lost time, which are more difficult to estimate. Thus, a vehicle standing in the repair shop will generally represent a far heavier charge than the actual cost of repair. Much money may be saved by finding exactly the kinds of fuel and oil best suited to the various kinds of car in operation, and it by no means follows that the cheapest articles prove the most economical. It is of interest to note that in a road transport undertaking direct wages absorb practically 50 per cent. of the total all-in costs; fuel costs are 33 per cent. of running costs and 11 per cent. of all-in costs; while the importance of lubrication cannot be measured by the proportion of the sum to the total expenses.

"The Novel—What it is, and what it is not," was the title of an address by MR. SHAW DESMOND. A novelist himself, he believes that the novel is the most important work in the world; we can do without architects, town-planners, advertisers, but not without novelists, because they are "really the media between mankind as a whole and the Power that lies behind life, and this to such a degree as neither the painter, the sculptor nor any other artist can claim." The lecturer proceeded to appreciate the work of many of our leading novelists, limiting himself to the consideration of those who have "the right to write," and then proceeded to discuss such problems as inspiration, plot and style. Turning to the future of the novel, Mr. Shaw Desmond expressed his belief that mere plot and story would tend more and more to disappear, their place being taken by philosophy.

MR. JOSEPH BURTON, in his paper "Quality in Pottery," discussed the various points that make for artistic beauty in porcelain and earthenware. Both chemist

and artist-craftsman are responsible for these, the latter for shape and design, the former mainly for the effects that may be obtained from skilful firing and glazing. The work of the Chinese potters of the Sung Dynasty was discussed, and attention was drawn to the main features which give it its characteristic beauty—a beauty which has never been surpassed in ancient or modern times. While dealing with the question of glazes, Mr. Burton described a self-modelling effect which has been developed with delightful results under his auspices. Using a glaze of very high viscosity and surface tension, he found that there was a tendency in the glaze when in a semi-molten condition to contract on itself and to curl up. It is possible to control this action, and thus for the first time in the history of pottery the artist has at his command a self-modelling glaze which he can manipulate as he pleases. Examples of pottery made by this process revealed some charming effects of colour and design, and a quality of surface which was particularly delightful.

A paper entitled “Observations on the Mining Laws of the British Empire” was read by MR. GILBERT STONE. At present there is great diversity in the mining laws in various parts of the Empire, and a plea was made not only for greater uniformity, but that they should be so amended as positively to encourage industry instead of merely not imposing obstacles. To promote these ends Mr. Stone urged that prospectors, upon whom the discovery of mineral wealth depends, should be actively encouraged by providing geological information, prospecting appliances, assaying assistance, transport facilities, etc. Capital should be encouraged to assist in mining development; titles should be sure, terms long and areas adequate; rents should be small, and should merge into royalties, which should not be onerous. Modern methods of mining are vastly more expensive than those which were in operation when our mineral laws were being drafted, and the area over which mining is now conducted is enormously larger than it was half a century ago. These alterations in methods and magnitudes should be reflected in our mining laws.

The Trueman Wood Lecture was delivered by SIR THOMAS HOLLAND, who chose for his subject “International Movement of Minerals in Peace and War.” It was shown that the minerals of the world are distributed in such a way that every country is dependent on others outside itself for some of the materials essential both in peace and in war. The industries of Great Britain, for example, could not now be carried on without copper from foreign sources, for even in peace time we consume twice as much as the whole Empire at present produces. China supplies about two-thirds of the world’s needs of antimony. The British Empire produces 90 per cent. of the asbestos, and 63 per cent. of the chromite supplies. Canada and the Belgian Congo share practically the whole output of cobalt. In this distribution of the mineral wealth of the world Sir Thomas Holland saw a possible means of preventing war, and suggested that every country in the League of Nations should add a rider to its Kellogg Treaty with the United States giving its Government the power, if and when necessary, to prohibit the export of mineral products to any

country that breaks the peace with any other member of the Pact. In this way the aggressive nation, cut off from essential supplies of minerals, would be reduced to impotence in a few days.

It is not often that man reaches the very first rank in three separate branches of art, but MR. D. S. MACCOLL, in his paper "Alfred Stevens—Sculptor, Painter, Architect," showed that England had produced one artist who in versatility of genius as well as height of accomplishment was fit to be ranked with the world's great master, Michael Angelo. He is, perhaps, best known to the general public as the sculptor of the superb monument to the Duke of Wellington in St. Paul's Cathedral. It is remarkable that in the competition for this work his design was placed sixth on the list of awards, and he probably would not have received the commission but for the fact that his model was the only one that fitted the place where it was to be erected. Other masterly work of his was designed and executed for the interior of Dorchester House, Park Lane, which has just been pulled down to make room for modern "improvements." From the considerable number of slides shown during the lecture, the audience were able to see that Mr. MacColl had not exaggerated the merits of Stevens in classing him among the greatest artists of the world.

In view of the enormous extent of South America and the possibilities of markets for British goods, much interest was taken in SIR WILLIAM CLARE LEES's paper "Some Aspects of Trade with South America." As a member of the British Economic Mission, which under the chairmanship of Lord D'Abernon recently visited South America, Sir William was able, not only to supply the latest available statistics relating to trade with Argentina, Brazil and Uruguay, but also to estimate the possibilities and the means of increasing our trade with these countries. In addition to historic bonds of friendship between them, Argentina and Britain are more dependent on each other than any other two countries in the world. Each produces what the other lacks; *e.g.*, Britain takes 99 per cent. of their chilled beef, while the amount of British capital invested in Argentina is estimated at over £500,000,000. At the same time statistics show that during the last fifteen years, while our share of trade with Argentina has decreased from 31 per cent. to 19.4 per cent., the United States' share has risen from 14.7 per cent. to 25.4 per cent. The reasons for these changes were examined and the opinion was expressed that South America generally is perfectly willing to give us business if and when we can supply exactly what she requires.

MR. HOLBROOK JACKSON, in his paper "Colour Determination in the Fashion Trades," dealt with a subject of great importance to all who purvey for the fashion trades. What is to be the ruling colour next spring or autumn? The manufacturer who knows the answer to this conundrum can prepare himself well in advance to supply a great demand, but who shall know beforehand the vagaries of such a will-o'-the-wisp as Fashion? At present it appears that colour determination is based almost entirely on French opinion, and fashion colours are determined, not predicted. The battle of fashion colours is thus very largely a matter of propaganda.

Some account was given of the various ways in which the arbiters of fashion impose their will upon their victims, and incidentally it was pointed out that although France possesses a genius for creative fashion work, among the artists of the French fashion trade are a number of English designers of the highest distinction. In the course of his paper Mr. Holbrook Jackson put in a plea for the standardisation of colour names. At present there is great confusion in this respect, and one of the objects of the newly-formed British Colour Council is to secure some uniformity of nomenclature.

In view of the great public interest aroused by the Exhibition of Italian Art at the Royal Academy, it was considered advisable to devote an evening to the subject, and a paper entitled "Italian Art and the Italian Exhibition" was read by MR. W. G. CONSTABLE, Assistant Director of the National Gallery. The aim of the lecture was not to pick out the plums from the Exhibition, but to indicate in broad outline the history of Italian painting as exemplified there. The artist in Italy did not endeavour to hold up a looking glass to Nature, as was to a large extent the case with the Dutch masters, but to make clear the emotions which inspired the actions of men and women, and the drama which united those actions. Consequently the art of Italy is one of the most difficult European arts to understand and appreciate. This thesis was illustrated by a large number of lantern slides of the great Italian masterpieces, by means of which the lecturer traced the development from classical and Byzantine art of the Tuscan, Sieneese, Florentine and later schools up to the close of the eighteenth century.

In her paper, "The Portrait in our Later Monumental Sculpture," MRS. KATHERINE B. ESDAILE dealt with a field which has remained comparatively unexplored. In the middle ages the figure on a tomb was hardly ever a portrait. The patron sent to the "tomb-maker," as he was called, an order for an effigy—knight, lady or priest—and generally received a figure from "stock," made a little more personal by heraldry or supporters. But after 1500 a change set in. It became quite an ordinary thing for a great man to erect his tomb in his own lifetime, and the sculptors, who had formerly lived near the quarries from which they obtained their materials, moved to London to be in closer connection with their patrons. Some of these obtained great reputations, notably Nicholas Johnson of Southwark. Shakespeare's family applied to him in the first instance for the effigy to adorn the tomb in Stratford-on-Avon, but apparently they were unwilling to pay the price asked, for they finally went to his inferior younger brother, Gerard. As time went on, more and more attention was paid to portraiture, with the result that figures on tombs ceased to be "stock" goods and became individual sculptures.

PROFESSOR G. ELLIOT SMITH delivered a lecture under the Dr. Mann Trust on "The Human Brain." At the outset he referred to the theory of Dr. Gall, who, in spite of the notoriety he obtained as a phrenological quack, achieved distinction by being the first to localise the functions of the brain in its various parts—a theory which started modern research on right lines. The principal problem discussed in the lecture was: "What is the difference between the brain of man

and the brain of other creatures ? ” While the human brain differs from that of, say, the gorilla in the greater extent of the parietal, frontal and temporal areas, the features of both brains are the result of the growing significance of vision. Most animals have their eyes on either side of their heads, but man and, in a lesser degree, the apes have developed the power of stereoscopic vision, and, according to the lecturer, man’s immediate ancestors became differentiated from other mammals as the result of the growing importance of vision, by means of which he gradually attained an aesthetic sense and an appreciation of beauty of form, texture and colour.

More than half a century has passed since Dr. Charles Graham gave his course of Cantor Lectures on “ The Chemistry of Brewing.” These soon came to be recognised as a classic work, and were all the more valuable because they were practically the first sound attempt to deal with brewing as a science. Before this time the trade of brewing, though one of the oldest in the world, had relied for success on empirical and rule of thumb methods. At the present day, however, there is perhaps no industry which is so dependent on the help of science. In his paper, “ Brewing as a Branch of Science,” PROFESSOR ARTHUR R. LING traced the history of this development and showed the parts played by Schwann, Pasteur, Liebig, Cornelius, O’Sullivan, Horace Brown, Armstrong, Chapman, and other workers who had all contributed to the study of fermentation. The work of these pioneers had led largely to the development of the science known as bio-chemistry, and had been of the greatest importance in elucidating many of the mysteries of life. At the conclusion of his paper Professor Ling described the work of the Department of Brewing in the University of Birmingham, over which he presides, and which now provides a large number of chemists who enter the brewing and its allied industries.

The arts of the tiler and slater, the bricklayer, and the carpenter and joiner were discussed by MR. NATHANIEL LLOYD, in a paper which he read on “ Building Craftsmanship.” With the aid of a large number of lantern slides he showed the difference between pleasing and unpleasing work in these trades. One of the charms of many Cotswold roofs lies in the fact that instead of there being an angle in the valley where the gable roof meets the main roof, the valley is curved, so that a charming sweep is produced. Similarly the design of a dormer window may make or mar a house. If the dormer stands too high and shows a great expanse of lead; it is ill-proportioned and ugly, but if it sits down snugly in the roof it gives a delightful effect. Several pictures were shown of good and bad chimneys, and the various kinds of brick bonds were illustrated, showing how it is possible to get delightful variety in a brick wall. Some beautiful examples of doors and windows were exhibited—notably one of the superb bay windows of Moreton Old Hall, with its inscription : “ Richard Dale, carpenter, made this window by the grace of God.”

In order to illustrate how quickly the human mind becomes accustomed to radical changes, MR. HOWARD M. ROBERTSON opened his paper on “ Architecture of To-day and To-morrow ” by a series of lantern slides contrasting the fashions

in dress, motor cars, etc., of twenty-five years ago with those of to-day. The costume of the woman tennis champion of 1905 appears to us now almost incredibly clumsy. We have rapidly become used to the most daring innovations in female fashion, and in the same way what are now regarded as startling novelties in architecture will in a few years be regarded as commonplaces. Although in domestic building the demand for change has hitherto been comparatively slight, in other categories the programme has been modified greatly. Huge factories, great office buildings with rapid means of vertical transport by lifts, railway and air stations with vast spans, shops in which enormous areas of uninterrupted floor space are required—these have all been rendered possible by modern developments of science, and they have no precedents in antiquity. Mr. Robertson, in a series of lantern slides, showed what is being done in these directions in many countries besides our own, and he concluded with a plea that the younger generation of our architectural students should be encouraged to keep a fresh outlook, and a warning against “official architecture” (i.e., extensive public works designed by Government departments), which always tends to keep in a groove.

PROFESSOR F. A. E. CREW, in his paper, “Genetical Methods of Livestock Improvement,” stated his belief that the only sound policy for the British farmer lies in increased production of livestock, and that, consequently, the science of genetics is of supreme importance in assisting him to obtain the kind of animal best fitted to meet his requirements. It is the function of the geneticist to find the causes of such troubles as low fertility, sterility, etc., and to show the breeder how to avoid them. Many stallions, bulls and rams are used for stud purposes which, although they may have made a name for themselves in agricultural shows, carry in them the seeds that lead to trouble in their offspring. For this reason it was urged that considerations which at present ensure success in the show rings should be changed, and that sires should be judged by the record of their offspring. It was also further suggested that all sires used for the stud should be the property of the State, this being the only way of eliminating the use of such evil influences as the “scrub bull.” Some reference was made to the action of various ductless glands, and the idea was put forward that in the future it might be possible to use these in order to control fertility, fat deposition, and so forth.

In November, 1925, Lord Bledisloe, speaking at one of the Society’s Ordinary Meetings, suggested that the Forest of Dean should be converted into a National Park. The idea was immediately taken up by the Press and excited a large amount of public interest—so much so that a Committee was appointed by the Government to enquire fully into the possibilities of giving it practical effect. It was, therefore, opportune that a paper on “National Parks” should be given by Mr. S. K. RATCLIFFE, who had just returned from a long tour of the United States and Canada, where he had been making a special study of the subject. He described the great reservations which have been set apart on the North American continent for the purpose of conserving the national scenery and the fauna and flora of the country ;

he also spoke of the successful efforts which have been made by several American cities to establish park-like amenities in their immediate neighbourhood—a department of town-planning in which the United States bid fair to lead the world. The problem as affecting Great Britain was discussed, and reference was made to the various areas which have been suggested as possible sites for National Parks in this country.

The fact that rice is the staple food of half the population of the globe lent special interest to MR. CHARLES E. DOUGLAS' paper, "The Cultivation and Preparation of Rice." Its methods of cultivation are at once the most antiquated and the most up-to-date employed in the world. In the Far East the ground is merely scratched by a plough which is as primitive as its ancestor of five thousand years ago, whereas in America rice has been sown by aeroplane, a distinction which has probably not yet been achieved by any other cereal. The means of preparation vary in similar fashion, from the most primitive winnowing and thrashing methods to the latest American machinery. Incidentally, the lecturer dealt with the dietetic value of different preparations of rice. The most expensive highly polished grain has been deprived of the brownish cuticle, the absence of which, in a very limited diet, may lead to such deficiency diseases as beri-beri, while the grain in which some of this cuticle has been retained is a much more valuable food, but as it is not so pretty to look at it fails to find favour with housewives.

The bicentenary of the birth of Josiah Wedgwood provided a fitting occasion for a paper by MR. HARRY BARNARD on "Josiah Wedgwood, F.R.S., Potter, Inventor, and Man of Science." Before the time of Wedgwood the tables of the "well-to-do" were furnished with pewter and of the more wealthy with silver plate, while in the homes of the middle-class—the farmer, shop-keeper and artisan—the table ware was confined to a few pottery articles of a very coarse description, such as butter pots, many-handled mugs for passing from hand to hand, and porringers which were placed in the centre of the table to receive the contents of the stew-pot. Individual plates or knives and forks were unknown, and each member of the family helped himself with his fingers from the porringer. The universal use of china or pottery for every table service is mainly due to Josiah Wedgwood, who from the age of fourteen, when he was apprenticed to his brother Thomas, applied indefatigable industry and all the resources of an inventive mind to the improvement of the potter's art. He developed it in one direction after another during a working life of fifty years, and his name is associated with many different varieties of pottery or china—cream-coloured or "Queen's" ware, "pearl" ware, "jasper" ware, in which he made a celebrated series of medallion portraits, black basaltes, "red china," and many other types. In addition to his great services in developing the pottery industry he was a man of unusual breadth of mind and public spirit, taking a leading part in local movements for the provision of adequate roads and a school for the children of Burslem.

II—INDIAN SECTION

Six papers were read at meetings of the Indian Section during the Session.

"The Indian cinematograph industry" was the subject of a paper by MR. A. M. GREEN. The number of indigenous films produced has shown a remarkable increase, having been doubled within a period of four years, while the footage of Indian films examined by the Boards of Censors rose from less than half-a-million in 1921-22 to nearly one-and-a-half million in 1927-28. Film production in India has the advantage of brilliant sunshine, and, although the technique is generally much below Western standards, the stories of Indian mythology, which provide the majority of the scenarios, appear to be more popular with Indian audiences than the usual plots of American and European films. The lecturer emphasised the importance of the film in India as an engine for propaganda in the sphere of public health, agricultural improvement and general education. One or two Indian films have already met with success on the European market, and the lecturer expressed the view that, with increased European co-operation on the technical side, Indian films possessing a genuine Indian inspiration might be widely successful both in and outside India.

In a paper on "The Economic Progress of India," SIR BASIL BLACKETT gave an outline of the considerable economic changes which have taken place in India since the beginning of the present century. Although throughout vast areas of the country there has been no perceptible change since 1900, elsewhere, as at Jamshedpur in Bihar, where the great Tata iron and steel works have created a large manufacturing town of over 100,000 inhabitants, and in the jute manufacturing area of Bengal, there has been an immense development. Side by side with these changes in the industrial sphere, which are the deliberate outcome of the progressive policy pursued by the Government of India since Lord Curzon's viceroyalty, increased attention has been paid to scientific research in the field of agriculture, while under the policy of discriminating protection, which has been adopted since 1923, protection has been given to steel, papermaking, cotton and other industries. In conclusion the lecturer expressed the hope that with an abandonment by India of medieval ways of thought it was within her power to make correspondingly great advances in the economic sphere and to attain an immeasurably higher standard of living.

In a paper entitled "Recent Mineral Developments in India," MR. G. H. TIPPER presented a statistical survey, mainly based on the Reports of the Geological Survey of India, of the output and value of the principal Indian minerals, viz., coal, oil, manganese ore, iron ore, lead, gold, copper, tin, and wolfram, during the seven years' period from 1922 to 1928. While the output of the most important minerals shows a considerable increase during this period, the value of the output, owing to a general fall in world prices, has somewhat declined from the peak point of 1924. Indian "muscovite" mica has always held a leading position in the world's supply, and the world-wide extension of the electrical industries, in which mica is largely used, makes mica a very important

mineral. The output of coal is considerable, being about one-twelfth of that of Great Britain, while in regard to iron ore India is the second producer in the Empire, and the large reserves which she possesses of this important mineral are an asset of great potential value.

India is still the largest customer for British manufactures, and the position and prospects of the British export trade in this market were reviewed by Mr. T. M. AINSCOUGH in a paper on "British Trade with India." Mr. Ainscough's survey revealed the disquieting fact that Great Britain's share of India's total imports has declined from an average of 63% in the quinquennium immediately preceding the war to less than 45% in the fiscal year 1928-9. The "bazaar trades," which include cotton and woollen piece goods, and the lower grades of metals, hardware, chemicals, etc., account for almost the whole of the lost ground, the heavy trades, comprising iron and steel, machinery, railway, harbour, and Public Works' plant, engineering stores, etc., having been able substantially to maintain their position. The chief reasons for the decline are the higher production costs in this country due to heavy taxation and other special conditions resulting from the war and to the greatly increased competition from foreign countries. The remedy indicated by the lecturer is the rationalisation of production, marketing, and finance, and he appealed to British manufacturers, exporters and bankers to take a closer and more active interest in India's progress and economic development.

The Sir George Birdwood Memorial Lecture was delivered this year by SIR WOLSELEY HAIG, who chose as his subject "The Maratha Nation." The Marathas, whose country stretches along the western coast of India from Daman in the north to beyond Goa in the south and inland beyond the Ghats into Central India, are numerically a small people, numbering about nine millions, but the part they have played in Indian history since the 12th century has been far greater than these numbers would suggest. The lecturer devoted a considerable portion of his survey of their intricate but romantic history to the victorious career of the great Maratha hero, Shivaji, who, in the 17th century, by a series of brilliant campaigns, made himself master of a large part of Central and Southern India. He was a great administrator as well as a great captain and during his life-time the Mahratta kingdom was more efficiently governed than any other part of India. Even after the death of Shivaji in 1680, at the early age of 52, the Mahrattas continued to be a constant menace to the Mogul Emperors of Delhi, with whom they were frequently in conflict. Though their power received a crushing blow at the historic field of Panipat in 1761 at the hands of the Afghan invader, Ahmad Khan, the Mahratta nation survived, and it required four wars to compel this brave and warlike people to accept the sovereignty of Great Britain.

In a paper on "The Report of the Royal Commission on Indian Agriculture" DR. DAVID CLOUSTON provided a comprehensive analysis of the principal recommendations made in the Report. One of the leading recommendations was in regard to the establishment of an Imperial Council of Agricultural Research

and a considerable portion of the Report is devoted to this important subject in its various aspects of plant improvement by hybridisation and other methods, acclimatisation, the breeding of the most suitable types of cattle, etc. Other salient aspects of the question, such as education, communications, marketing and grading, co-operation, and sanitation, are also dealt with, but in the lecturer's view far the most important factor is the outlook of the peasant himself, for no substantial improvement in agriculture can be expected unless the cultivator has the will to achieve a better standard of living and the capacity in terms of mental equipment and physical health to take advantage of the opportunities which science, wise laws and good administration may place at his disposal.

III—DOMINIONS AND COLONIES SECTION

Four papers were read at meetings of the Dominions and Colonies Section during the Session.

"Settlers' Problems in Kenya" was the subject of a paper by SIR DANIEL HALL, who had recently visited East Africa. It was only after the South African War and the opening of the railway in 1903 that any white settlers penetrated the country with the intention of living by agriculture. At first they turned their attention to stock farming, but were soon driven by the virulence of a number of endemic diseases, such as rinderpest, East Coast fever, redwater and anthrax, to direct their best efforts to agriculture, the growing of maize, wheat, and, later on, of sisal and coffee. The lecturer dealt with various aspects of stock-farming, the gradual diminution of disease by such measures as the elimination of "squatter" cattle, fencing and dipping, and the laying down of artificial pastures. On the question of breed he pronounced in favour of improving the breed by selection among the native cattle, which have acquired some power of resistance to disease, on the lines followed by the great English breeders in the 18th and early 19th centuries, in preference to crossing the native cattle with pure-bred sires from one of the well-known English breeds. The lecturer also dealt with the various difficulties and problems which confronted the farmer in connection with the main agricultural crops, coffee, sisal, maize, wheat and barley, emphasising the importance of artificial and green manuring and of establishing Research organisations or Institutes for the investigation of botanical, entomological and chemical problems.

The importance of research in connection with tropical agriculture, to which attention has been drawn in several papers read before the Society in recent years, was again emphasised by DR. A. W. HILL in a paper entitled "Scientific and Industrial Research in the British Empire." The "Botanical Stations," which, largely as a result of the representations of Kew, were established first in the West Indies in 1887, and in subsequent years in the West and East African Colonies, did very valuable work, being responsible for such important developments as the introduction of cacao to the Gold Coast, which has brought prosperity to the Colony, and were eventually expanded into Agricultural Departments.

The lecturer referred to the fact that in Australia and New Zealand the need for centralised research work has also been realised and to some extent met by the establishment of research organisations, and emphasised the importance of the rôle played by Kew as a source of information to research workers in the tropical and sub-tropical portions of the Empire. The need for research and for increased collaboration in this matter between the Governments of the various territories was urged, and in this connection the lecturer referred to the recent report of the Lovat Committee relating to a unified Colonial Agricultural Service. The inadequate supply of trained men is one of the chief difficulties connected with research, and the lecturer entered a plea for improving the material prospects of research workers whose labours often produce results of incalculable economic importance.

The British Association for the Advancement of Science was founded in 1831, and even at that time one of its founders had the prevision to say that "the foundation of a general national institution has been laid, which, fixed to no spot, is free to range from city to city of this great Empire." In a paper on "The Work of the British Association in relation to the Empire," Mr. O. J. R. HOWARTH gave some account of the seven overseas visits which have taken place since 1884, when the first overseas meeting was held in Canada. These visits serve the very useful purpose, in the words of the Charter of the Association, of "promoting intercourse" among scientific men throughout the Empire, and have had very fruitful and valuable results both overseas and in this country. An instance of the latter was the recommendation made by the Association to the Board of Agriculture, as a result of their inspection of the agricultural experimental stations in Canada in 1897, as to the desirability of co-ordinating existing institutions for agricultural research in this country, and of strengthening the scientific work of the Board itself—a policy which has been carried out with such good effect during the last thirty years. In conclusion, Mr. Howarth gave a short analysis of a typical programme of work carried out at these meetings, selecting, as the most appropriate example, the meeting in South Africa last year, which was presided over by Sir Thomas Holland, formerly a Chairman of the Council of the Society.

Four years ago an organised national effort was made under the auspices of the National Food Canning Council to expand the canning of fruits and vegetables in Great Britain. Remarkable progress has already been made, and it is now possible to buy British canned peas and other vegetables which possess a far superior flavour to the ordinary foreign brands. In view of the success which has attended this effort and of the experience and knowledge which has been gained, the time now appears ripe for an extension of the campaign to the Colonial Empire and India. An Empire Canning Council has been formed, and its Chairman, SIR EDGAR JONES, initiated the campaign by a paper on "The Empire Canning Industry." In view of the fact that Great Britain and the self-governing Dominions are already organised to some extent for the production and marketing

of canned goods, it is proposed, at any rate in the first instance, to confine the movement to the Colonial Empire and India. In many parts of these Territories there is a glut of fruit, vegetables, or fish at certain times of the year, while at other times great scarcity prevails. The native populations are already learning to consume considerable quantities of canned goods, which at present are imported from outside the Empire, and the establishment of canning factories, wherever the conditions are suitable, would obviate the necessity of purchasing abroad and at the same time make available a cheap and plentiful supply of food. The lecturer appealed to large rubber companies and other important corporations interested in our tropical dependencies to consider adding canning operations to their business, and to our Colonial Governors and administrators to give their support to an effort, the success of which would be so beneficial to the territories under their charge.

IV.—DR. MANN JUVENILE LECTURES

In the two Juvenile Lectures delivered under the Dr. Mann Trust, CAPTAIN C. W. R. KNIGHT described first, the golden eagle, and second, wild life in the tree tops. Both lectures were illustrated by most admirable films revealing the intimate details of bird family life. In addition to being of extraordinary interest, some of the films were of extreme beauty, notably those showing in slow motion the flight of eagles and herons. A feature that proved of special attraction to the young audience was the presence of Mr. Ramshaw, Captain Knight's pet golden eagle, who was so tame that he gladly suffered the children to crowd round him and stroke his feathers.

V.—CANTOR LECTURES

The first course of lectures under the Cantor Trust was delivered by DR E. G. RICHARDSON, his subject being "Wind Instruments from Musical and Scientific Aspects." Starting with primitive pipes he described the methods of exciting sounds in them, and then proceeded to deal with early organ pipes, and the effects produced by the introduction of side holes. Early reed pipes and brass instruments were discussed, and descriptions were given of the way in which air is set in vibration in them. The importance of edge-tones in playing the flute was elucidated, and attention was paid to the effect of the shape, material and "scale" of the pipe. Finally, the lecturer dealt with the modern flute, clarinet, oboe, brass instruments with pistons and the trombone. A number of illustrations were given to illustrate the lectures.

MR. HAROLD WRIGHT gave the second course on "Three Master Etchers: Rembrandt, Méryon, Whistler." In the first lecture, after referring to the earliest etchings of Rembrandt, the lecturer dealt in turn with his etchings of beggars, of Biblical subjects, landscapes and portraits, and finally traced his influence on later etchers. The second lecture was devoted to Méryon, who, after a youthful voyage to the South Seas, returned to Europe to become one of the great masters of

etching. Some account was given of his initiation into painting and etching, of his etchings after Zeeman, of the Paris etchings, the Bourges and South Sea plates and the portraits. The third lecture was devoted to Whistler, and dealt with the etchings of Alsace and Paris, the Thames series, the portraits and landscapes in dry-point, the first and second Venetian series, the Cameos, the etchings of Touraine, Brussels and the Netherlands. Each lecture was illustrated by fine specimens of the master's works.

MR. ALFRED B. SEARLE gave a course of three lectures on "Recent Improvements in Methods of Brickmaking." The enormous quantities of bricks which are now needed annually necessitate the employment of mechanical means of production from many kinds of materials. In the first lecture were described the latest methods of making bricks from plastic or potentially plastic clays. In the second lecture special attention was given to describing the stiff-plastic process and the semi-dry process, and to the construction of the tunnel kiln and its effect on brick work design. The third lecture dealt with methods of making bricks of non-plastic materials, such as sand-lime, slag, clinker, cement, concrete silica, magnesite, etc.

VI.—THOMAS GRAY MEMORIAL LECTURES

Under the Thomas Gray Memorial Trust, which was founded to promote "the advancement of the Science of Navigation and the Scientific and Educational Interests of the British Mercantile Marine," a course of three lectures was delivered by COMMANDER F. G. COOPER, on "Aids to Navigation." He described the mariner's compass in its various forms, the marine chronometer, the uses of parallel rulers and protractors, the sextant and quadrant, dividers and range finders. In the second lecture he discussed the latest developments in sounding machines, submarine sound signals, the baro-cyclonometer, telescopes and binoculars, while the third lecture dealt, *inter alia*, with the clear view screen, various patent logs, navigation in fog, tide charts, nautical tables, and finally the noctovisor.

VII.—ALBERT MEDAL

The Albert Medal of the Society for the current year has been awarded by the Council, with the approval of the President, H.R.H. the Duke of Connaught, to Professor Henry E. Armstrong, LL.D., D.Sc., F.R.S., "for his discoveries in Chemistry and his services to Education."

Professor Henry Edward Armstrong entered upon a notable career as an investigator and teacher nearly sixty years ago (first paper, 1873); his research work has ranged over practically the whole of chemical science. He was one of the first to recognise that chemical reactions are often of a much more complex nature than is represented by the ordinary chemical equation. In this connection he was led to make a comprehensive experimental study of the complicated nature of the products obtained by the action of nitric acid on metals; he was also one of the first

to realise the importance of the part played by traces of water in promoting or starting a number of apparently simple chemical changes.

Dr. Armstrong has made many contributions to our chemical knowledge of the terpenes and of camphor and his pioneer work on the sulphonation of the aromatic hydrocarbons has become classical. The vast scheme of experimental work which he conceived and put into practice on the substitution derivatives of naphthalene led to results which were not only of great scientific value but also assisted very materially in the technical development of those great series of coal tar dyes in the production of which naphthalene is used ; none of these results were patented, but all were published in the scientific journals and made freely available to the chemical technologist. His work on the relation between the colour and the molecular structure of chemical compounds, on the chemistry of photography, and on the more subtle aspects of the problem of valency may also be noted as original in outlook and fruitful in results.

Dr. Armstrong could not have made all these and many other contributions to chemical science if his mastery of scientific method and his skill as an experimenter had not been supplemented by his genius as a teacher ; he was responsible for the organisation of the chemical schools of the Finsbury Technical College and the Central Institute at South Kensington, which were founded under the auspices of the City Livery Companies. In this capacity he trained a large numbers of students many of whom became his enthusiastic collaborators, and are now scattered all over the world as holders of important positions in chemical science and chemical technology.

VIII—MEDALS FOR PAPERS

Twelve silver medals have been awarded for papers read before the Society during the current session—nine for papers read at Ordinary Meetings, two for papers read before the Indian Section, and one for those read before the Dominions and Colonies Section.

The awards are as follows :—

Papers read at the Ordinary Meetings :—

J. O. Boving, " New Developments in Hydraulic Pneumatic Engineering."

Gilbert Stone, Barrister-at-Law, Legal Consultant to the Advisory Council on Minerals of the Imperial Institute, " Observations on the Mining Laws of the British Empire."

Sir William Clare Lees, O.B.E. (British Economic Mission to South America), " Some Aspects of the Question of Trade with South America."

D. S. MacColl, M.A., D.Litt., LL.D., " Alfred Stevens—Sculptor, Painter, Architect."

William G. Constable, M.A., F.S.A., Assistant Director of the National Gallery, " Italian Art and the Italian Exhibition."

Mrs. Arundell Esdaile, " The Portrait in later Monumental Sculpture."

Howard Robertson, F.R.I.B.A., Principal of the Architectural Association Schools, "Architecture of To-day and To-morrow."

Professor F. A. E. Crew, M.D., D.Sc., Ph.D., Director, Animal Breeding Research Department, University of Edinburgh, "Genetical Methods of Livestock Improvement."

Harry Barnard, "The Father of English Pottery—Josiah Wedgwood, F.R.S., Potter, Inventor and Man of Science."

Papers read before the Indian Section :—

A. M. Green, I.C.S., Acting Trade Commissioner for India, "The Indian Cinema Industry."

T. M. Ainscough, C.B.E., H.M. Senior Trade Commissioner in India and Ceylon, "British Trade in India."

Paper read before the Dominions and Colonies Section :—

Sir Edgar R. Jones, K.B.E., "The Empire Canning Industry."

For many years it has been the practice not to award medals either to members of the Council or to persons who have already received a medal for a paper read in a previous year. The Council were therefore precluded from considering the following papers :—

Mr. P. Morley Horder, F.S.A., "Urban and Rural Amenities."

Sir Basil P. Blackett, K.C.B., K.C.S.I., "The Economic Progress of India."

Sir Daniel Hall, K.C.B., D.Sc., LL.D., F.R.S., "Settlers Problems in Kenya."

The Council, however, desire to express their high appreciation of these papers.

IX—FUND FOR THE PRESERVATION OF ANCIENT COTTAGES

In the last Annual Report some particulars were given of the purchase of West Wycombe, with a view to preserving for posterity a totally unspoilt English village. The sum required for the purchase was £13,500. A year ago £3,375 had been paid, the rest being left on mortgage. The Council are now in hopes of being able to pay off the rest of the mortgage, £8,500, at a very early date. This, however, will to a very large extent deplete the Fund, and the vital matter of reconditioning the cottages remains to be dealt with. Some of these are, unfortunately, in a very dilapidated state. It is difficult to estimate the amount that will be required to put them in proper order, but it will probably not be less than £10,000, and an earnest appeal is made to all those who appreciate the charm of the English countryside to assist the Council in the task which they have undertaken.

Arrangements have been made for letting two of the inns on long leases, and it is believed that West Wycombe will soon be able to boast two examples of what an old English inn ought to be.

A very charming little Queen Anne house has been fitted up as a Guest

House, where visitors to West Wycombe will be able to obtain refreshments, learn about the activities of the Society, and, if they are so inclined, deposit their contributions to the good cause.

It is intended to publish in the *Journal*, from time to time, reports of the progress made at West Wycombe, the rate of which, it may be added, will depend upon the rate at which financial assistance is received.

X.—THOMAS GRAY MEMORIAL TRUST.

REPORT ON THE COMPETITIONS OF 1929

Under the Thomas Gray Memorial Trust, the objects of which are "The Advancement of the Science of Navigation and the Scientific and Educational Interests of the British Mercantile Marine," the Council in 1929 offered the following Prizes :—

I.—PRIZE FOR AN IMPROVEMENT IN THE SCIENCE OR PRACTICE OF NAVIGATION.

A Prize of £150 to any person who may bring to their notice a valuable improvement in the Science or Practice of Navigation proposed or invented by himself in the years 1928 and 1929.

Twenty-five entries were submitted for this Prize. On the unanimous recommendation of the Judges, the Council awarded the Prize of £150 to

A. T. DOODSON, D.Sc., Associate Director, Liverpool Observatory and Tidal Institute, for his work on "The Analysis and Prediction of Tidal Currents."

II.—PRIZE FOR AN ESSAY.

A Prize of £50 for an essay on the following subject :—

"You are overtaken by a revolving storm. Discuss the handling of a low-powered steamer from the time of the first indication of the approach of the storm until the storm has passed, supposing the ship to be in (a) the safe semicircle, (b) the dangerous semicircle, and (c) the direct path of the storm's centre."

Sixty-nine essays were submitted for this Prize. On the unanimous recommendation of the Judges, the Council awarded the Prize of £50 to

J. S. COMMANDER,

Master, ss. *British Ensign*,

The British Tanker Co., Ltd.

and they commended the essay of

LIEUT. J. S. STEVENS, R.N., Royal Naval Staff College, Greenwich.

PRIZES OFFERED IN 1930.

The following Prizes have been offered for competition in 1930 :—

I.—PRIZE FOR AN INVENTION.

A Prize of £100 to any person who may bring to their notice a valuable improvement in the Science or Practice of Navigation proposed or invented by himself in the years 1929 and 1930.

II.—PRIZE FOR AN ESSAY.

A Prize of £100 for an essay on the following subject :—

“ The Training of Apprentices and Cadets with a view to their becoming efficient Officers in the Merchant Service.”

Full particulars of the conditions were published in the *Journal* of April 25th, 1930 (see pages 649-50).

The Council have again offered the following prizes to the best students of Navigation in the schools mentioned below for the year 1929-30 :—

Three prizes of £10 each to the Nautical College, Pangbourne ; *Conway*, Birkenhead ; *Worcester*, Greenhithe.

Four prizes of £5 each to *Arethusa*, London ; *Warspite*, London ; *Indefatigable*, London ; *Mercury*, Southampton.

In order to stimulate further the study of navigation, the Council last year offered a Thomas Gray Memorial Prize of £30 to be competed for by the best students of the Nautical College, Pangbourne, the *Conway* and the *Worcester*

The prize was awarded to Donald Edward Forman, Nautical College, Pangbourne, *Proxime accessit* Walker Harold Waghorne, H.M.S. *Worcester* Training College, and Commended, Hugh H. Gordon Tracey, Nautical Training College, Pangbourne.

XI—ANNUAL COMPETITION OF INDUSTRIAL DESIGNS

The seventh Annual Competition of Industrial Designs will be held at the Imperial Institute in July, by kind permission of the Director.

The competition is again being held in the following sections :—(1) Architectural Decoration ; (2) Textiles ; (3) Furniture ; (4) Book Production ; (5) Pottery and Glass ; and (6) Advertising (Posters, Show-cards, etc.). The total value of the prizes offered in all the sections amounts to about £2,000. A number of well-known firms have again offered very substantial prizes for designs in various sections.

It has always been the aim of the Council and of the various committees appointed by them to carry out this competition to ensure that any designs approved by them should bear evidence that the designers possess not only exceptional artistic ability, but also a sound and practical knowledge of the materials and processes of their trades. The committees consist mainly of representatives of important manufacturing and commercial firms, and the judges nominated by them are careful to see that approved designs are suitable for the materials for which they are intended.

After the awards have been made, a number of selected designs will be exhibited at the Imperial Institute. As soon as the judges have completed their work, it is proposed to issue, as formerly, a full report on the Competition, which will be circulated widely among manufacturers and competitors.

The Council have opened a Bureau of Information, at which are kept the names and addresses of those candidates at the Annual Competition of Industrial Designs whose work has been accepted for exhibition and who desire to obtain employment as designers. Although no guarantee of employment can be given,

the information is placed at the service of manufacturers in search of designers. A number of appointments have been made in this way, and a good many designs have been sold at the exhibitions.

The Council would like to place on record the success of a candidate who won a Travelling Scholarship in 1928 and who, on her return from the Continent, received an appointment as designer with the firm who had provided the Scholarship. Last year she designed the firm's "best seller."

XII.—EXAMINATIONS

The total number of entries for the ordinary examinations held at Easter, Whitsuntide and in July was 92,471. The number of entries for the London County Council Grouped Course Examination (conducted at the request of the London County Council for Junior Commercial and Junior Technical Institutes), was 2,788, each candidate working three papers. For the School and Junior School Certificate Examinations the entries were 208 and 817 respectively; each candidate in these examinations must work seven, and may work nine papers. The total number of papers applied for in all the examinations was 109,265, as compared with 105,676 in 1929.

A full report on the Examinations will, as usual, be published in the *Journal* at a later date.

The liberality of the Worshipful Company of Clothworkers has enabled the Council, as in past years, to offer the usual silver and bronze medals. These medals are greatly valued by the successful candidates, and they contribute not a little to maintain the high standard of the examinations.

XIII.—ORAL EXAMINATIONS IN MODERN LANGUAGES

The Oral Examinations are still in progress in various parts of the country. Particulars will be given in the annual report on the Examinations.

XIV.—NEW COUNCIL

The Vice-Presidents retiring under the ordinary regulations are: Sir Robert Hadfield, Sir Herbert Jackson and Major Sir Humphrey Leggett. There was also a fourth vacancy caused by the death of Sir Frank Warner. In their places the Council recommend the Marquis of Linlithgow, Sir Edwin Lutyens, Sir Harry McGowan (none of whom have served on the Council in any capacity during the current year), and Mr. Carmichael Thomas.

The Ordinary Members of Council retiring under the regulations are: Colonel Sir Arthur Holbrook, Sir Richard Redmayne, Mr. Carmichael Thomas and Lt.-Colonel Sir Arnold Wilson. In their place the Council recommend Sir Felix Brunner, Professor Sir H. C. H. Carpenter, the Hon. R. Stafford Cripps and Colonel Sir Frederick Nathan, none of whom have served on the Council in any capacity during the current year.

XV—OBITUARY

During the last twelve months the Society has lost a number of distinguished Fellows.

Mr. Alan A. Campbell Swinton had the unusual distinction of being elected Chairman of the Council for two periods, 1917-19 and 1920-22. It was largely due to his initiative and practical help that the Society succeeded in purchasing the freehold of their house in 1922.

Sir Frank Warner served on the Council from 1917 up to the time of his death. He originated the idea of the Society's Annual Competition of Industrial Designs, and the success of this movement was due in very large measure to the interest and skill with which he guided its development.

Lord Newlands was a Fellow of the Society from 1912, and was a Vice-President for the period 1915-17.

Major Percy A. MacMahon was also a Vice-President for 1923-25.

Mr. Edward Dent served on the Council for the periods 1916-19 and 1920-23, and was a very frequent attendant at the Society's meetings.

Sir Valentine Chirol delivered the *Birdwood Lecture* in 1920, and took a deep interest in the work of the Indian Section.

Sir John Cockburn read several papers before the Society, and often took part in the discussions.

Sir Alfred Ashbolt was a very useful member of the Dominions and Colonies Section Committee.

Obituary notices of these and some other Fellows of the Society have appeared in the *Journal* since the last Annual General Meeting.

XVI—FINANCE

The Financial Statement for 1929, published in accordance with Section 25 of the Society's Bye-Laws in the *Journal* of June 20th, shows that the excess of expenditure over income for the year was £16.9s. 1d. There is still a deficit of some £4,000 on the fund for purchasing and reconditioning the Society's House. If this amount could be cleared off there is little doubt that the Financial Statement would at once show a balance on the right side.

THE CHAIRMAN, in moving the adoption of the Report, said that the business of the Society grew as the years passed by with more sections, more papers, more medals, more scholarships, and in particular more entries for the Examinations, which had now reached the vast number of well over 100,000 a year. He would suggest that although the Society had many interesting papers the members should not be at all backward in inducing any good speaker to offer their services with a paper on some branch of Art, Industry or Commerce. It was true that audiences at a particular lecture might not be in some instances very large, but the *Journal*, in which papers were published, had a circulation which extended to almost every

country in the world, and particularly to our Dominions and Colonies and India. The Designs Competition, due to the energies of Sir Frank Warner, whose death had been such a loss to the Society, had been a continued success, and there could not be a greater tribute to his memory than that the Competition should continue to be held annually and supported as energetically as he supported it. The growth of the Examinations really started after the War, when there were comparatively few entries, but entries had increased every year by thousands, and the certificate of the Society had become a credential of good knowledge of those points which a candidate for a post must have. Many of the candidates who passed examinations at the present time might, when they got on in the world, owe some debt of gratitude to the Society and become members, thereby spreading the influence to others. One salient instance was the last Chairman of the Council, Sir George Sutton, who was most generous in many ways in remembrance of the advantage he had received from the Society in his early days.

SIR PHILIP MAGNUS, Bt., in seconding the motion, said that the Report contained a large amount of valuable information on many matters connected with Science and other subjects. He did not think it was necessary to add anything to what the Chairman had said, and was very pleased indeed to second the adoption of the Report.

The Report was unanimously adopted.

THE CHAIRMAN explained that since the circulation of the Balloting List it had been proposed by Sir Edward Gait and seconded by Sir Herbert Jackson that the name of Sir Charles Bayley, a very old and active member of the Society, be inserted in the list of Vice-Presidents in place of the name of Mr. P. Morley Horder, whose name appeared in the printed list, and as Mr. Horder desired to stand there had to be a ballot.

THE CHAIRMAN appointed MR. NOEL HEATON and MR. WARRE BRADLEY scrutineers and declared the ballot open.

THE CHAIRMAN proposed a cordial vote of thanks to Mr. G. K. Menzies (the Secretary), Mr. W. Perry (the Assistant-Secretary and Secretary of the Indian and Dominions and Colonies Sections), Mr. J. H. Buchanan (the Accountant and Examinations Officer), Mr. C. D. Cassidy (the Librarian), Mr. H. J. Dack (the Chief Clerk), Mr. C. Hoare (the Society's Housekeeper), and to the other Officers of the Society, for their services during the year.

The motion was duly seconded, and the vote of thanks carried unanimously.

THE SECRETARY, in returning thanks for this expression of confidence in himself and the other Officers of the Society said that he was pleased that the name of Mr. Hoare, the Society's Housekeeper, had been mentioned, as he was very sorry to

say that after 24 years' service he and Mrs. Hoare were about to retire. The Council had very kindly agreed to grant them not only a pension but a present of a clock with a suitable inscription and a cheque, with which Mr. Hoare and his wife were very pleased.

THE SECRETARY read the following statement with reference to the Society's Property at Clapton :—" The Society possesses certain ground rents at Clapton. These were purchased in 1889, when the sum of £3,175 3s. 1d. was paid for them, and the receipts are £141 per annum. Some time ago the Council received a bad report on the state of the property from a Member of the Council. About a year ago Messrs. Eiloart, Son & Inman, who inspected it on behalf of the Society, gave a rather better account, and they assessed the value at £2,500 to £2,900. The Finance Committee have felt for some time that it would be advisable to sell this property if a reasonable price could be obtained. The owner of the leases of the houses is anxious to buy the freehold, and has offered £2,800. This at 5 per cent. would bring in £140 a year, which is almost exactly the present income. The Council recommended that the offer be accepted, and under the terms of the Charter brought it forward for confirmation."

THE CHAIRMAN said that the Finance Committee had gone into the matter very carefully. The Society had held the property for 40 years, and he thought they could use the money much better by investing it in something not likely to involve any liability in the future.

The motion, having been duly seconded, was carried unanimously.

The scrutineers having reported, the CHAIRMAN declared that the nominated Vice-Presidents were all elected with the exception of Mr. Morley Horder, Sir Charles Bayley being elected by a large majority. The following is the list of those elected to fill the several offices. (The names in *italics* are of those Fellows who have not, during the past year, filled the office to which they have been elected) :—

PRESIDENT

H.R.H. The Duke of Connaught and Strathearn, K.G.

VICE-PRESIDENTS

Edward F. Armstrong, Ph.D., D.Sc., F.R.S.

*Lord Askwith, K.C.B., K.C., D.L.

Llewelyn B. Atkinson, M.I.E.E.

Sir Charles S. Bayley, G.C.I.E., K.C.S.I.

Sir Otto Beit, Bt., K.C.M.G.

Sir Basil P. Blackett, K.C.B., K.C.S.I.

Captain Sir Arthur Clarke, K.B.E.

- *Sir Dugald Clerk, K.B.E., D.Sc., F.R.S.
Sir William Henry Davison, K.B.E., D.L., M.P.
Peter Macintyre Evans, M.A., LL.D.
Sir Edward Gait, K.C.S.I., C.I.E.
Rear-Admiral James de Courcy Hamilton, M.V.O.
John S. Highfield, M.Inst.C.E., M.I.E.E.
Marquis of Linlithgow, K.T., G.C.I.E.
Sir Edwin Lutyens, R.A.
Sir Philip Magnus, Bt.
Sir George Marjoribanks, K.C.V.O.
Sir Reginald A. Mant, K.C.I.E., C.S.I.
Sir Harry McGowan, K.B.E.
*Hon. Sir Charles A. Parsons, O.M., K.C.B., LL.D., D.Sc., F.R.S.
Carmichael Thomas.
Henry T. Tizard, C.B., F.R.S.
Lord Wakefield, C.B.E., LL.D.

ORDINARY MEMBERS OF COUNCIL

Alfred C. Bossom, F.R.I.B.A.
Sir Felix Brunner, Bt.
Professor Sir H. C. H. Carpenter, F.R.S.
Sir David Chadwick, C.S.I., C.I.E.
Sir Atul C. Chatterjee, K.C.I.E.
Hon. R. Stafford Cripps, K.C.
Col. Sir Henry McMahon, G.C.M.G., G.C.V.O.
Sir Henry A. Miers, F.R.S.
John A. Milne, C.B.E.
Col. Sir Frederick Nathan, K.B.E.
Col. The Master of Sempill.
James Swinburne, F.R.S.

TREASURERS

Sir Charles H. Armstrong.
Sir George Sutton, Bt.

*Nominated by H.R.H. the President.

A vote of thanks to the scrutineers was carried unanimously.

SIR EDWARD GAIT, K.C.S.I., C.I.E., proposed a vote of thanks to Lord Askwith for taking the Chair in the absence of Mr. Atkinson, which was carried unanimously.

THE CHAIRMAN acknowledged the vote of thanks, and the meeting terminated.

NOTES ON BOOKS

A DESCRIPTION OF THE RESIDENCE OF SIR JOHN SOANE. 11th edition. Edited by A. T. Bolton. Oxford : The University Press. 3s.

Sir John Soane's description of his famous home, with Mr. Bolton's notes, makes a perfect handbook for the visitor, and remains an elegant memento of what should be a memorable hour or two for any person of sensibility.

All good collections of works of art have something topical about them, since art is only on the surface corruptible by time, and since a thing of beauty is a joy for ever. But naturally where the setting of a collection is itself a sort of work of art this topicality is the more marked. And in so far as the residence of Sir John Soane keeps a personal atmosphere, in spite of the quantity of diverse pieces with which it is filled, visitors will perennially be induced to make lively comparisons between the taste of one generation and that of another—their own.

The architect of the old Bank of England was a great gentleman (though of humble birth), with a fine edge both to his intelligence and his temper, a man of public spirit gifted with energy and a bent for culture. His architectural conceptions were in the classical tradition, but his interpretation of classicism, like that of builders greater than himself, was not a literal, severe one. He had a fanciful imagination, as one can see from the ingenious arrangement of his apartments and museum, with their systems of lighting from above, their moveable planes and other means of saving space ; but he was no eccentric, and certainly one does not have the impression that he ever wanted to be clever merely for the sake of cleverness. Even the breakfast parlour, with its hundred and more convex mirrors of all sizes does not appear ill-judged in any detail : what a delightful room it is !

Atmosphere apart, and books and plans apart, many will find a visit worth making on account of the choice collection of Hogarths or the alabaster sarcophagus of Seti. There is sculpture by Flaxman, furniture by Chippendale and Hepplewhite, there are gems, illuminated manuscripts and Greek vases. There are two very fine examples of Gothic wood carving. Soane looks down on it all from his portrait by Lawrence ; we can see what a gracious and complete personality he possessed, and how he typified ideals that are not altogether those of our own time. P.B.

INNENDEKORATION. January, 1930. Publishers : Koch, Darmstadt : Germany.

We have been sent the current number of this periodical for notice. *Innendekoration*, which is now forty years old, is sumptuously printed and its character reflects faithfully one aspect of the present-day mentality of a typical progressive community. Whatever we may think of modern taste, we must agree that its actual phase is better than the last. Provoked into a reciprocal heavy-handedness, man is doing unto his mechanisms what they did unto him. He may have sunk low, but his pedigree is a long one, and now that he is expressing himself again instead of remaining passive we see traces of personality inside and outside our houses once more. Ugliness is often a sort of nullity ; slums and Victorian rococo mansions nauseate the spirit because they correspond to no inner reality.

An important part of this number of *Innendekoration* is given up to a well illustrated description of a house at Heidelberg. A most agreeable place it seems, and quite in the modern continental manner, with, however, just enough overhanging cornice to add a homely touch sometimes conspicuously lacking in M. Corbusier's work. The interiors are emancipated without being extreme ; like most of their kind they are curiously unfeminine, and really not so much masculine as neuter. It is to this that too much emphasis on function must always lead.

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No. 4051

FRIDAY, JULY 11th, 1930

VOL. LXXVIII

All Communications for the Society should be addressed to the Secretary, John Street, Adelphi, W.C.2.

NEWS OF THE WEEK

Art Galleries.—HENRY HOLIDAY, 1839-1927 : MEMORIAL EXHIBITION AT WALKER'S GALLERIES, 118 NEW BOND STREET, W.—In considering the exhibition of stained glass, water-colour and pencil drawings by the late Henry Holiday—the works remaining in his studio at the time of his death—we must bear in mind the period in which he was born and the length of his years. To modern eyes, accustomed to unbridled licence in all forms of art, when almost anything may be termed decorative at the whim of its perpetrator, Holiday's work may well seem old-fashioned. Yet certain it is that it dates definitely. None the less, Holiday cut a considerable figure amongst the decorative artists of his time. It is impossible not to admire his industry and his stubborn adherence to his ideals. He was of the kindred of the Pre-Raphaelites, of Poynter, of Burne-Jones, of Albert Moore and of Leighton, and unquestionably filled a not unhonoured place by their side. Yet as an artist he is of lesser stature than the least of these.

In spite of the eulogy of Mr. A. L. Baldry, who has written the essay on Henry Holiday for Messrs. Walker's "Quarterly," his claim to rank as a master is disputable. There is a lack of virility and robustness in his drawing that makes it wearisome to look at. His pre-occupation with the problems of space-filling, and his predilection for scattering his subject matter evenly over the surface in a mosaic of small details led to a certain monotony, confusing to the eye and wanting in focus.

By far the most important section of his work, as it is the most numerous, is his stained glass. The catalogue at the end of Messrs. Walker's "Quarterly" devoted to Henry Holiday, gives over 400 items, as windows or groups of windows, many executed in a single year, and in several cases of whole churches. It is in the medium of stained glass that Holiday reached and best sustained, his high-water mark.

It may be complained that it is hardly fair to judge of the artist's quality by what remained in his studio at his death, but on the *ex pede Herculem* principle, and helped out by the reproductions in colour in the "Quarterly" and by one's previous knowledge, it is possible to get at some estimate of his powers. Here it seems to us that industry is not enough; personal vision and strength of draughtsmanship count for more. It is said that Holiday would have none of hide-bound convention, but we find that in avoiding one mannerism he fell into another. Holiday's decorative work may have assorted with Ruskinian ideals, but it had no life of its own. Notice how tedious, how laboured, and how lifeless are the well-known cartoons for the "Dream of Fair Women," series of windows, drawn to a conventional and characterless standard—and, remember that Alfred Stevens was his contemporary.

Besides stained glass, Holiday executed important mural paintings, works in mosaic, *opus sectile*, tempera, oil and water-colour. He painted portraits, landscapes, marines and he essayed a few pieces in sculpture, of which the moot celebrated is the "Sleep," in tinted plaster (R.A., 1881), and the latest "Jacob's Ladder," a relief at St. Peter's, Bushey, exhibited in 1921.

The most popular of his oil paintings, known to every one from its numerous reproductions, is "The Meeting of Dante and Beatrice," exhibited in the Grosvenor Gallery in 1883, and purchased for the Walker Art Gallery, Liverpool. Of the pictures shown at Messrs. Walker's in Bond Street, the "Rhine Maidens," painted in 1880, will give a very fair idea of Holiday's skill as a painter. The illustrations to "The Hunting of the Snark," in black and white for wood-engraving, lent by Mr. Harold Hartley, show yet another facet of his many-sided talent and reveal an accomplished technique and a rather unsuspected sense of humour. In these we take real delight.

Holiday was also a pamphleteer and lecturer. He took a keen and practical interest in Religion, in Music, in Dress, Astronomy and Garden Cities. It is strange that so much vigour and activity of mind should not have manifested itself more clearly in the quality of his art.

H. GRANVILLE FELL.

PROCEEDINGS OF THE SOCIETY.

INDIAN SECTION.

FRIDAY, MAY 9TH, 1930

SIR JAMES MACKENNA, C.I.E., in the Chair.

THE CHAIRMAN, in introducing the lecturer, said that Dr. Clouston had been a member of the Agricultural Department in the Central Provinces of India and had risen to be Director of his Department; he had then gone to Pusa as Director of the

Pusa Research Institute and Agricultural Adviser to the Government of India, and while holding that appointment had acted as liaison officer with the Royal Commission on Agriculture in India, the members of which were greatly indebted to him for the very efficient way in which he had assisted them with a large number of well-considered minutes on the various matters for consideration. He was admirably qualified to give an opinion on the Report of the Commission, because he could speak not only as one who had been closely associated with the Commission but as an officer of very wide experience in the Agricultural Department.

The following paper was then read:—

THE REPORT OF THE ROYAL COMMISSION ON INDIAN AGRICULTURE

By DAVID CLOUSTON, C.I.E., M.A., D.Sc.

(late Agricultural Adviser to the Government of India and Director,
Agricultural Research Institute, Pusa)

(1). The Royal Commission on Agriculture in India was appointed in 1926 to examine and report on the present conditions of agriculture and rural economy in British India and to make recommendations for the improvement of agriculture and the promotion of the welfare and prosperity of the rural population ; in particular to investigate :—

(a) the measures now being taken for the promotion of agricultural and veterinary research, experiment, demonstration and education ; for the compilation of agricultural statistics ; for the introduction of new and better crops and for improvement in agricultural practice, dairy farming and the breeding of stock ;

(b) the existing methods of transport and marketing of agricultural produce and stock ;

(c) the methods by which agricultural operations are financed and credit afforded to agriculturists ;

(d) the main factors affecting the rural prosperity and welfare of the agricultural population ;

and to make recommendations.

(2). The Commission examined 395 witnesses of whom 178 were officials and 217 non-officials, and in 1928 wrote their Report, which contains nearly 900 pages, the first hundred of which are devoted to an excellently written abridged report. The Report opens with an introductory chapter in which the village—the unit of rural India—and the economic changes which have taken place therein within the last two centuries are described. India, it is pointed out, is pre-eminently the land of the small holder. In the South and East the size of the average holding is about five acres, and elsewhere not more than half the holdings exceed this limit. In India, agriculture counts for far more than all her other industries put together ;

73.9 per cent. of the population get their livelihood from the land ; in Great Britain the corresponding percentage is about 14½. In her 500,000 villages the common interest is agriculture and the causes which affect its prosperity. In early times each village was more or less self-contained. It produced almost everything in the way of food and clothing required by the villagers ; for any surplus there was little or no demand. The opening of the Suez Canal and the improvement of communications in India itself stimulated trade and commerce and the cultivation of crops for which there was a demand abroad. It stimulated, too, a demand in India for commodities manufactured in other lands. India was thus brought into touch with foreign markets. Improved communications added greatly to the prosperity of the country and to its security against famine. Her trade increased enormously ; in 1869 her exports were valued at 80 crores of rupees ; for the three years ending in 1926-27, the average value of her annual exports exceeded 350 crores. But there were other factors which contributed to her prosperity. Under British administration internal peace and security were firmly established, an elaborate and exhaustive inquiry into rights in land carried out, the State demand fixed and the cultivator assured that the fruits of his labour would be left to him.

(3). In the second chapter of their Report, the Commission give an account of the efforts made by Government from 1839 onwards to utilise scientific knowledge in the development of agriculture in India, but a serious endeavour to frame a policy of research in agriculture was not made till 1889, when Dr. Voelcker was appointed by the Government of India to advise upon the best course to be adopted in order to apply the teachings of agricultural chemistry to Indian agriculture and to effect improvements in it. In the beginning of the present century there was a great awakening of interest in the scientific study of agriculture both in Great Britain and India. In 1903 a forward policy in matters of agricultural research and improvement was embarked on in India by the Government of the late Lord Curzon, to whose far-sighted vision much of the progress in Indian agriculture must be attributed. An agricultural research institute was established at Pusa and steps were taken to develop agricultural research, experiment, demonstration and education in the provinces, and most gratifying progress was made in all four directions. When the constitutional changes occurred in 1919, the administration of the Agricultural, Veterinary, Co-operative Credit, Public Health and Medical departments was transferred in all the major provinces to the Governor acting with a Minister. The Government of India divested themselves, except to a very limited extent of all powers of superintendence, direction and control over the administration of " transferred " subjects, and no specific provision was made for co-ordinating research work, either as between the central and provincial spheres, or between province and province. As pointed out by the Royal Commission on Agriculture, the provincial departments of agriculture were, in the all-important matter of research, left without the stimulus of a central organisation which could guide and co-ordinate their policy, with the result that research and experiment, the basis of all agricultural progress, suffered a setback. To remedy this state of affairs they

propose that an Imperial Council of Agricultural Research should be constituted, the primary function of which would be to promote, guide and co-ordinate agricultural research throughout India and to link it with agricultural research in other parts of the British Empire and in foreign countries. They further propose that this Council should be entrusted with the administration of a non-lapsing fund of 50 lakhs to which additions should be made from time to time as financial conditions permitted. The Council was to be a body to which the Imperial and provincial departments of agriculture could look for guidance in all matters connected with research and to which such research programmes as they might choose would be submitted for criticism and approval. The Council was to consist of 39 members, three of whom were to be whole-time members. Of the remaining 36 members, 8 were to be nominated by the Government of India, 18 were to represent the provincial agricultural and veterinary departments, 3 the Indian Universities, 2 the Indian Central Cotton Committee, and planting community respectively, and 5 were to be non-official members nominated by the Council for the approval of the Government of India. In addition to the primary functions already mentioned, this Council was to make arrangements for the training of research workers ; act as a clearing house of information in regard not only to research, but also to agricultural and veterinary matters generally ; take over the publication work carried out by the Agricultural Adviser to the Government of India, and make grants from its funds for research schemes. The post of Agricultural Adviser to the Government of India was to be abolished and his duties transferred to the three whole-time members of the Research Council. His duties as Director of Pusa were to be taken over by a whole-time Director to be appointed to that Institute.

(4). In the constitution of 1919 no provision was made whereby expenditure from central revenues could be incurred on research work carried out in provincial institutions. The Commission, therefore, propose that the Devolution Rules should be altered, so as to make it permissible to incur expenditure from central revenues on research in provincial institutions. This is a most important recommendation for without funds a Council of this kind would not be in a position to get research schemes started.

(5). The recommendations of the Commission with respect to the establishment of an Imperial Council of Agricultural Research, and the provision of funds for research are likely to have far-reaching results. On these recommendations the Government of India have taken prompt action. A Research Council was established and funds provided about nine months ago ; but for political reasons that Council has been constituted on a basis different from that recommended by the Commission. It has been modelled on the Indian Research Fund Association with a Governing Body and an Advisory Board. The Honourable Member for Education, Health and Lands is Chairman of the Council. On the Governing Body there are 16 members. They are : The Honourable Member for Education, Health and Lands, the Ministers for Agriculture in the provinces which have ministers, and the Members in charge of the Portfolio of Agriculture in those provinces which have

no Ministers at present ; one member of the Council of State ; two Members of the Legislative Assembly ; one representative of the Associated Chambers of Commerce of India and Ceylon ; one representative of the Federation of Indian Chambers of Commerce and Industry, and the Secretary for Education, Health and Lands. The Constitution of the Advisory Board is very similar to that recommended by the Commission for the Research Council. The duty of this Board is, it would appear, to tender advice to the Governing Body ; a Body for which the Commission did not bargain in their scheme.

(6). The Council has already started work of considerable importance and proposals for new undertakings in the field of research, and applications for financial aid are coming in from Provincial Governments and Universities. Relations have been established with International and Imperial Institutions too, and a representative has been appointed to the Executive Council of the Imperial Agricultural Bureaux. A Committee to advise on the steps which should be taken to assist the Indian Sugar Industry and a Sub-Committee to investigate the problems relating to the conservation of indigenous manurial resources and the use of indigenous fertilisers have been constituted. In the provinces, provincial agricultural Committees have been, or are being formed, to serve as links between the provinces and the Council as recommended by the Commission.

(7). The Commission emphasise the fact that for research India now requires a more specialised type of officer and that when an appointment has to be filled, the best man should be selected wherever he can be found. The field of recruitment ought not to be restricted to the province itself or to India. With a view to reducing the risks of political interference in the recruitment of officers for the highest posts in the agricultural services, they recommend that Public Service Acts should be passed in each province, but pending the constitution of Public Services Commissions in the provinces, promotions, and direct appointments to posts, should be made on the recommendations of a strong Selection Committee. With a view to improving the standard of training given in the agricultural colleges, they propose that the staffs of these colleges should be strengthened, and that special care should be taken in selecting officers for the post of Principal. They propose, too, that Pusa should set the standard of agricultural research and become the recognised centre for post-graduate training in the agricultural sciences and that the staff should be strengthened with that end in view. They considered that the Director and Heads of Sections of that Institute should, in the main, be recruited from abroad, and that a whole-time Director should be appointed. On the latter recommendation the Government of India have already taken action ; an officer for the post of Director has been recruited in this country, and will shortly proceed to India.

(8). In Chapter 4 of their Report the Commission deal with agricultural improvements. The field is a vast one, for the area under cultivation in India is nearly 260 million acres, and the diversity of soils, local conditions and agricultural practices is very great. Little progress has as yet been made, they state, in introducing

improved manurial treatment into general practice. A large amount of the farm-yard manure available is used as fuel and agricultural departments are not at present in a position to give the cultivator reliable advice in regard to the economic use of fertilisers. They recommend that the existing data bearing on the use of manures should be carefully studied and a programme of experiments drawn up with the aid of the Imperial Agricultural Research Council, with the object of ascertaining the extent to which fertilisers can profitably be used. They propose, too, that steps should be taken to promote the better preservation of such farmyard manure as is not required for fuel and that the possibilities of manufacturing synthetic farmyard manure should be explored.

(9). The work done in improving India's staple crops is reviewed at some length in the Report. When that work was begun about 25 years ago, the plant breeders of the departments of agriculture found that most of the crops of the country were badly mixed. The cultivator had paid but scant attention to the purity of the varieties; they had got mixed on the thrashing floor or in the ginning factory as the case may be. India had not produced a Garton, nor had she seedsmen of the kind found in more advanced countries. Our plant breeders, on starting work, first isolated the different forms found in the mixtures, and then tested each under field conditions. The most efficient forms were finally selected for distribution to the cultivators. There are now about 10 million acres under improved crops in India, and the bulk of that area is under varieties of wheat, cotton, rice and jute, which were selected in this way.

(10). Another method of crop improvement which has given outstanding results is hybridisation. The hybrid sugar canes produced on the Coimbatore Cane-breeding Station which is controlled by the Government of India possess great vigour of growth and give from 50 to 100 per cent. more sugar per acre than the indigenous varieties commonly grown in the principal cane-growing tracts in India. The area under these hybrids has within a comparatively few years risen to a quarter of a million acres. The history of these new sugar canes reads like a fairy tale. About 17 years ago, Dr. Barber, one of my colleagues in the Department, discovered that the sugar canes grown in Coimbatore district of Madras Presidency produced fertile seed. As a result of that discovery hundreds of thousands of hybrid canes have been evolved, of which the most productive forms have been propagated and distributed all over India. They have been sent, too, to several other countries and glowing reports of their performances in these foreign lands have been received. The work initiated by Dr. Barber at the Coimbatore Cane-breeding Station is now being carried on very ably by Rao Bahadur Vankateraman, whom he trained as an assistant.

(11). The third method of crop improvement which has been practised in India with considerable success is acclimatisation, by which I mean the adaptation of exotic varieties to Indian conditions. The Commission refer in their report to the rapid spread of foreign varieties of ground nut. In several provinces exotic varieties have largely replaced the indigenous kinds, because they are less liable to diseases

and more easily harvested. Exotic cottons of the American Upland species have spread over an area of a million acres, and almost all the tropical sugar canes grown in India are foreign varieties.

(12). The Commission give it as their opinion that of these three methods of crop improvement, selection is that which in general offers the greatest possibilities. Experiments in the introduction of foreign varieties should they say continue, but that work should in no circumstances take precedence of that of improving by selection varieties already grown in India.

(13). Departments of agriculture in India have found it necessary to build up an organisation for the propagation and distribution of their improved varieties of crops. These varieties, after being thoroughly tested on Government experimental farms, are propagated on both Government and private seed farms. These private seed farms are run by enterprising landholders who are in close touch with the work of the agricultural department in their province: they are inspected by members of the district staff of the department who advise the owners with respect to the measures to be adopted for keeping the seed pure. Thousands of such farms have been established in India; in the Central Provinces alone there were about 8,000 in 1927. The Commission give it as their opinion that until reliable seed merchants come into the business, the selection and distribution of improved seed should be controlled by the agricultural departments, but that they should invoke the assistance of co-operative agencies in its distribution to a greater extent than they have done in the past. As this branch of the department's work is of enormous importance, they consider that a separate organisation should be created to deal with it, and that an officer of the rank of deputy director should be put in charge of it.

(14). Though the Commission omit to say so in their report, very good progress has been made by departments of agriculture in India in introducing improved types of agricultural implements and machinery. Hundreds of thousands of improved ploughs and cane mills, and thousands of fodder-cutters, hoes and other implements have been introduced. The Commission were of opinion, however, that the engineering section of the agricultural departments was not as strong as it should be, considering the enormous importance of implements and machinery in agriculture. They recommend that this Section should be reorganised and the staff strengthened. In designing new implements the aim should be, they say, to evolve a small number of types suitable for a wide range of conditions. The manufacture of these improved types should then be taken up in India.

(15). Agricultural improvements evolved by departments of agriculture are of little use until and unless they are incorporated into the farm practice of the cultivators. In Chapter 6 of the Report the various methods of demonstration and propaganda practised by these departments are discussed and ocular demonstration recommended as the most suitable for India. Each improvement should be thoroughly tested before it is recommended for adoption, and it should be within the means of the cultivator. The most effective method of getting an improvement introduced is to demonstrate it on the cultivator's own land; but agricultural

shows, peripatetic demonstrations and demonstration trains also have their uses. Agricultural associations have, it is pointed out, done very useful work in the Central Provinces and Bombay. In the latter province, a systematic attempt has been made to co-ordinate the propaganda work of the agricultural and co-operative departments in respect of agricultural improvement by working through Taluka Development Associations, in which both departments take a lively interest. The Commission attached so much importance to the value of propaganda that they recommend that a special officer of the standing of a deputy director of agriculture should be attached to the office of the Director of Agriculture in each province to organise and systematise propaganda, and that the fullest possible use of co-operative credit societies should be made in introducing improvements.

(16). A serious obstacle to agricultural improvement in India is caused by the sub-division and fragmentation of holdings. The problem is being attacked with some success in the Punjab by the Co-operative Department, and by legislation in other two provinces. The Commission lay down what they consider the principles which should be embodied in any legislation designed to promote consolidation. Though I have no time to deal with these principles in this paper, they are, I may say, eminently sound.

(17). To the subjects of Animal Husbandry and Diseases of Livestock the Commission devote 133 pages of their Report. They were justified in discussing these subjects in great detail, for the prosperity of India's agriculture is bound up with the quality of her cattle. The bullock is the draught animal of the country, and milk and milk products bulk largely in the dietary of the people. The cattle in general are small and weak and a larger number is kept than should ordinarily be required for cultivation. As the human population has increased, areas formerly available for grazing have been brought under cultivation, with the result that the common grazing lands and all grass lands close to villages are now much overstocked. Over the greater part of India these grazing areas are parched and bare from December till June, and during this period the cattle are underfed and lose condition. Several witnesses who gave evidence advocated the extension of the grazing area, but that in the opinion of the Commission was not feasible. They recommend instead that an effort should be made to increase the productivity of the land already growing grass by regulating grazing on a rotational system, and that the cutting and storage of grass as hay, the cultivation of fodder crops, the making of silage and the use of chaff-cutters should be encouraged. They recommend in particular the cultivation of berseem, otherwise known as Egyptian clover.

(18). With respect to the breeding of better cattle, they consider that the aim should be to establish pure and improved types of the best cattle available in India; but this policy, they say, should not be endangered by an attempt to produce a "dual purpose" type suitable both for draught and milk. As a general rule, milking qualities should, they point out, be encouraged only in so far as these are entirely consistent with the maintenance of the essential features which good draught cattle must possess. This, I may say, is a veiled criticism of the policy of

those agricultural departments which have by selective breeding greatly improved the milking capacity of the cows of certain breeds. The Commission infer that selection on this basis might result in the breeding of types, the males of which would not be entirely suitable for draught purposes. Our cattle-breeding experts on the other hand hold that good draught qualities and good milking qualities can be combined in the same breed—an opinion based on experience, and supported by some of the ablest geneticists in this country. They hold, too, that the lack of attention given in India in the past to the breeding of good dual-purpose cows, accounts for the fact that large numbers of buffaloes are now kept for milk. Cows unfortunately, have to be maintained as well, for the ox is a much better draught animal than the buffalo. The position then is that two animals have to be fed—one to give milk, the other to give calves, whereas a dual-purpose cow gives both. The controversy concerning the dual-purpose cow is almost as keen in Great Britain as it is in India, but in this country it is beef and milk which have to be considered. The cow in this country, as in India, continues, I am glad to say, "to chew her cud at peace with the world in spite of the raging of experts."

The supply of milk available in the larger towns of India is most unsatisfactory at present. The Commission recommend that the municipal authorities of these towns should provide cowsheds outside municipal limits, promote or assist schemes aiming at large scale milk production, and establish depots for the collection, pasteurising and cooling of milk. They anticipate that on such commercial dairy farms set up for supplying milk to cities, cross-breeding with European breeds would be resorted to, on the lines followed on the Military dairy farms in India.

(19). The general prevalence of contagious bovine diseases is one of the serious obstacles to the improvement of cattle in India. Thousands of cattle die from such diseases every year. Rinderpest accounts for the largest number of deaths. The outstanding problem which faces the veterinary department is thus the control of contagious diseases. The serum-alone method, which is now very largely and effectively used in checking outbreaks of rinderpest, is described in the Report in some detail to illustrate the procedure followed by the veterinary departments in combating bovine diseases in general. As the serum-alone method of inoculation gives an immunity against the disease for a period of from 10 to 14 days only, the Commission recommend the introduction on a large scale of the serum-simultaneous method which gives an animal permanent immunity. They recommend, too, that an All-India Contagious Diseases of Animals Act should be passed with a view to ensuring a uniform procedure in dealing with contagious diseases. They consider that the control of measures for treating and preventing the spread of contagious diseases should be the concern of provincial governments; while the duty of providing a local veterinary service for treating diseases not scheduled as contagious diseases and for dealing with operations and wounds, should, when the necessary arrangements can be made, rest with local bodies. They propose, too, that the number of veterinary officers and assistants should be largely increased,

and that facilities should be provided at one of the existing veterinary colleges for the training of veterinary surgeons for the highest posts in the veterinary service.

(20). The Commission's enquiry extended to the activities of all the Government departments, which are closely concerned with rural welfare, and they endeavour to show the contribution which each of them can make to the creation of an environment favourable for progress. In India the forests provide the cultivator with fodder for his cattle and with timber for his domestic consumption. The Commission make certain proposals which, if given effect to, will, they think, improve the forests from the cultivator's point of view. They suggest that the possibilities of fodder supplies from forest areas should be carefully examined by the Forest and Agricultural departments and that schemes should be devised for the preservation of the best forest grasses and for the encouragement of grass cutting in preference to grazing. As the practice of burning cow-dung cakes is very general in India, and constitutes a heavy drain on the potential supply of manure, they propose that the possibilities of supplying an alternative fuel and of increasing fuel supplies in forests should be investigated. They discuss possible methods of establishing village forests and arrive at the conclusion that the most promising method is to hand over to village management certain more or less wooded areas now under the control of the Forest Department as has been done in Madras. They propose, too, that in each province Government should aim at establishing a division within the forest department to take charge of and develop village forests, fuel plantations, village woodlands and waste lands in the interests of the cultivators.

(21). The rainfall, on which the cropping system in India so largely depends, varies greatly from tract to tract. In some tracts it is normally insufficient to ripen the crop and no cultivation is possible until schemes of irrigation carry the essential water to the land ; in others it is precarious, and its failure at the time it is most required for crop growth spells disaster for the cultivator. The great extension of irrigation within the last 30 years has given India a measure of security against famine. The average area irrigated annually is now about 50 million acres, of which over one half is from Government irrigation works. The Commission describe the principal irrigation projects in hand or contemplated and discuss their possibilities from the agricultural point of view. They consider that the relations between the Agricultural and Irrigation Departments should be of the closest and they recommend that advisory committees should be created to deal with complaints from cultivators in regard to irrigation matters, that a Central Bureau of Information for Irrigation should be established, and that provision for research on irrigation problems should be made in all provinces in which irrigation is of importance.

(22). In the Chapter on Communications and Marketing it is pointed out that the great improvement which has taken place in communications since the middle of last century has encouraged the cultivation of commercial crops, such as cotton, jute and oilseeds. The mileage of railways and roads continues to expand ; but the latter have deteriorated in recent years. The increased cost of maintenance and the development of motor traffic have brought into existence an entirely new range

of problems of road construction and maintenance. The Commission recommend that Road Boards should be constituted in all provinces, and that special attention should be given to village roads.

(23). Marketing conditions in India are bad. The agricultural departments have done much to improve the quality and to increase the quantity of the cultivator's outturn, but they have not been able to give him substantial help in marketing it. The middleman is inclined to buy rather in quantity than quality. Under existing marketing conditions an adequate premium for quality is not ordinarily paid, and this encourages the cultivator to mix the good with the bad. The Commission received many complaints of the abuses practised by middlemen. They manipulate scales, and weights and measures, against the cultivator, make illegal deductions in the price and take advantage of him in many other directions. In the opinion of the Commission, the establishment of regulated markets on the Berar system would go far to remedy the disabilities under which the cultivator markets his produce at present. Local governments should, they say, take the initiative in this matter. They recommend, too, that weights and measures throughout India should be standardised.

(24). Much of the Indian agricultural produce exported to foreign markets is marketed in an unsatisfactory condition; Indian cotton, for example, is often a mixture of short and long staple varieties, and Indian hemp is uneven and contains much dust and dry mud. The Commission recommend that the agricultural and co-operative departments should take up the question of marketing, keep in close touch with trade requirements, and organise the sale of graded produce of superior quality. They stress the importance of grading and the desirability of arranging for the sale by auction of improved varieties in the earlier stages. Further they propose that an expert marketing officer should be appointed to the agricultural department in each province, to organise market surveys, examine the working of the regulated markets and make recommendations for their improvements when necessary.

(25). No subject allied to agriculture is more frequently referred to by the Commission than co-operation and its possibilities. If co-operation fails, they say, there will fail the best hope of rural India. They regard co-operation as the only possible means of relieving the cultivators from the burden of usury. They regard it, too, as a method by which they can be induced in large numbers to accept the advice of the experts employed by Government in its several departments. In 1927 there were in British India some 67,000 agricultural primary societies, with over 2½ million members and with a total working capital of nearly 25 crores of rupees. The progress of the movement has not been uniform in all provinces. In one or two provinces it has achieved much, but in others it has been a partial failure. The Commission attribute the unsatisfactory condition of the movement in these latter provinces to the lack of patient and persistent education of the members in the principles and meaning of co-operation. The remedy for this state of affairs is, they say, to build up a highly educated and well-trained official staff. A large number of honorary workers have interested themselves in co-operation, and their

contribution to the success of the movement has been great, but most of them have other professional or private interests and they cannot devote the amount of time necessary for detailed instruction or supervision of societies. The Commission lay great importance on the personality of the Registrar, the official head of the movement, and recommend that the best man available should be selected for this post. He should hold the appointment for not less than 5 years or more than ten and in the interests of continuity, he should have an assistant under him for training. To the failure to recognise the limitations inherent in the system of utilising honorary workers must be largely attributed, they say, the very serious defects in the movement which have been brought to their notice.

(26). In Chapter 15 of the Report the existing systems of education and their suitability to village conditions are discussed. So far as the general mass of the agricultural population is concerned, primary education and the attainment of literacy are the main considerations. The great importance to rural development in India of the spread of literacy among women is stressed and a suggestion made to the effect that the value to the community of the education of the women, particularly in its effect upon the spread of lasting literacy amongst the young, should be demonstrated in striking fashion. If a mother is literate a very strong influence will be brought to bear on keeping her children at school until literacy is assured. They give it as their opinion that the only remedy for the unsatisfactory state of primary education in India is the introduction of the compulsory system. Compulsion should be introduced as rapidly as local conditions permit and should be preceded by a campaign of explanation and persuasion.

The Report deals at length with the kind of education to be given to older boys in rural schools. Two existing types of education under trial, namely, that given at vocational agricultural schools and that given at vernacular middle schools in the curriculum of which elementary agriculture is included, are discussed. The former type finds favour in Bombay, the latter in the Punjab. The course given in the vocational schools in Bombay lasts for two years and the instruction is both theoretical and practical. In the Punjab elementary agriculture has been made an optional subject in ordinary vernacular middle schools. The instruction given in the classroom is illustrated and supplemented by practical work on the school plot or farm. The Commission consider that this, the Punjab type of school, has much to recommend it. It is a serious attempt to adapt rural education to rural needs. For vocational schools of the Bombay type there is no real demand and they are unduly expensive, and for these reasons they recommend that no more schools of this kind should be opened.

(27). With the other Chapters of the Report I have no time to deal at any length. The Commission deal comprehensively with sanitary and medical matters, and especially with the various agencies, official and non-official, for the improvement of the amenities of village life. They enumerate the various directions in which they consider that improvements can be brought about. They recognise that progress must be slow and can only be effected through the will of the people

themselves. Leadership is required and it must come from outside. The Universities have at once an obligation and a great opportunity to assist in the work of rural development on its economic and educative sides. The fine work done by Mr. Brayne in the Punjab through village guides is described and commended in the Report.

(28). The Report is a mine of information, reviewing as it does the work of all the Government departments concerned with rural welfare. It has been criticised on the score of its not dealing at all with the question of land tenure and of its dealing inadequately with the subjects of agricultural research and the introduction of improvements. Land tenure was not included in the terms of reference. As regards agricultural research and the introduction of improvements, they are discussed at some length in the Report, but the Commission have made it clear that material improvement based on scientific research is but one of several factors which make for the welfare of the peasant. There are other important factors to be considered, such as education, sanitation and medical relief; but far the most important is the outlook of the peasant himself, for no substantial improvement in agriculture can be effected, they say, unless the cultivator has the will to achieve a better standard of living and the capacity in terms of mental equipment and of physical health to take advantage of the opportunities which science, wise laws and good administration may place at his disposal. If the inertia of centuries is to be overcome, it is essential that all the resources at the disposal of the State should be brought to bear on the problem of rural uplift. What is required is an organised and sustained effort by all those departments whose activities touch the lives and surroundings of the rural population, and it is, they hold, the duty of government to initiate this combined effort. The responsibility in this matter of provincial Governors and of Ministers in charge of the transferred departments is great. His Excellency the Viceroy has set them a fine example. Throughout their enquiry the Commission were greatly impressed by the extent to which he had, by his personal interest in agricultural matters, forwarded the cause of India's premier industry.

DISCUSSION.

THE CHAIRMAN said he was sure those present would agree with him that Dr. Clouston had given them a very clear and interesting synopsis of the Report of the Royal Commission on Indian Agriculture. His only regret was that Dr. Clouston had been rather descriptive than critical, because he knew that Dr. Clouston did not agree with all the findings of the Royal Commission, and it would have been interesting to have had his point of view.

As Dr. Clouston had pointed out, the Council of Agricultural Research had not been formed exactly on the lines suggested by the Commission; if, however, it functioned as successfully as the Indian Research Fund Association, on which it was modelled, he did not think it would go far wrong. In any case, it had apparently made a good start and had got together an excellent advisory staff.

Personally, he was rather surprised and somewhat disappointed to find that the first subject it tackled was sugar, because he thought he had had the temerity to

say in this hall about eighteen months ago that the last word on sugar had been said in the Report of the Committee over which he had presided in 1919. The Council of Agricultural Research, however, seemed to think differently, and it was not for him to say whether they were right or wrong.

There were two subjects to which he hoped they would devote early attention. The first was the extremely difficult problem of agricultural and veterinary education, especially higher education. The second was the question of manures. The lecturer had told them that a sub-Committee to investigate the problems relating to the conservation of indigenous manurial resources and the use of indigenous fertilisers had been constituted. This was, of course, all to the good, but it was to be hoped that the possibilities of proved artificial manures already in the market would not be lost sight of. It would be a great disservice to the cultivator of India if a too zealous enthusiasm for the indigenous article postponed the placing within his reach of artificial manures, on the evolution of which the highest technical skill and research and thousands of pounds had been spent. Simultaneously, therefore, with this enquiry into available indigenous products, the results achieved on experimental farms with recognised artificial manures should be collated and schemes devised for their wider utilisation. Much work had already been done, and the fullest use should be made of the results achieved.

In the present depressed state of the Burma rice trade he saw no hope save in the general adoption of the improved varieties which the Agricultural Department had evolved. Some of these varieties he knew could compete in quality with the rices from European countries which had, temporarily, he hoped, captured their old markets. An increase in the quantity produced could be obtained by the utilisation of the manures which had been proved and recommended by the Agricultural Department. The cultivator who had any surplus available for sale was perfectly able to pay for these manures, and the increased out-turn would adequately recompense him for his expenditure.

It was hardly necessary to remind them that India bulked very largely in the news at the present time, and it was pleasant to see in one of the morning papers the statement that agricultural India was probably pursuing the even tenour of her way as quietly as usual. It had been his good fortune to spend practically all his 33 years' service in India in close touch with cultivators in every province of that vast Empire, and he was sure that this statement was true. There was nothing more peaceful than the quiet life of the rural areas of India. He wished to suggest to his young Indian friends that the best service they could render to their country was to get down seriously to the problems of agricultural improvement and rural development. Such efforts might not be spectacular, but they would have their reward.

SIR REGINALD CRADDOCK, G.C.I.E., K.C.S.I., formerly Lieut.-Governor of Burma, said that previously to being Commissioner in Nagpur he had been one of those amateur Directors of Agriculture who formerly existed in India, and had then met the first recruit to the new Agricultural Service in the person of Mr. David Clouston. All the questions with which the Report of the Royal Commission dealt had been discussed by the Agricultural Departments and the heads of the various Provinces for a good many years past; the Report contained almost nothing new; the great advantage of the Royal Commission was, however, that it had collected these materials, scattered as they were in the reports and bulletins of the various Provinces, had brought them together under one head, co-ordinated them and given them the weight of the authority which attached to the pronouncements of a Commission so composed. The Report was a sort of Bible of the Agricultural Department which one could open at any page and find something of the greatest practical value.

At the same time, there were one or two matters with which the Commission was unable to deal, though it would probably have desired to do so. For instance, the question of land tenures had been expressly excluded from the Commission's scope ; that was a most important problem with regard to the improvement of agriculture. The cultivator's security in his holding and the conditions under which he held it controlled the extent to which he could obtain credit. Though everything that could be done had been done to develop co-operative credit societies, the Revenue administrator in India must always keep before him the object that the actual tiller of the soil shall be the man who is prosperous and has security ; there was no other way in which in a country of small farming agriculture could produce the best results. The works of the Agricultural Departments depended upon their being staffed with men of energy, conscientious zeal, the capacity of inspiring their fellows, and of the scientific mind. He considered that the work which had been done by the Agricultural Departments since their inception had been marvellous.

MR. R. D. ANSTEAD, C.I.E., Director of Agriculture, Madras, said that when the Report was issued his Department in Madras had immediately formed a Provincial Agricultural Advisory Council, of which the Governor was Chairman. This Council had divided the recommendations into three groups : those they could carry out immediately with their existing organisation, those for which they would require administrative power and money, and those with which they did not agree and did not intend to carry out. They did not agree with the Commission that their work on the cross-breeding of cattle should be stopped. The work of a Provincial Agricultural Department was generally for practical purposes divided into two parts : research work and demonstration work to the peasant. Demonstration under Indian conditions must deal entirely with facts ; they could not possibly experiment on the ryot's land ; there were in India none of the scientific farmers such as he had recently seen in New Zealand. It was therefore necessary that the quality of research work should be extremely high, which meant that the officers in charge of that research work must be the very best ; Indian agriculture could not afford the second best. They must have the very best, even though this might result in a certain amount of disappointment under existing conditions.

SIR THOMAS MIDDLETON, K.C.I.E., K.B.E., C.B., said that as a member of the Commission he wished to express his appreciation of the services Dr. Clouston had rendered. Although the Report together with its appendices covered no less than 1,100 or 1,200 pages, the subject had by no means been exhausted. The Report had said little of the work of the Agricultural Departments because it had been felt that reports on that work were available ; he agreed with Sir Reginald Craddock that the results of that work during the last 30 or 40 years had been marvellous. When he, the speaker, had gone to India with the Royal Commission in 1926 thirty years had elapsed since he had last been in India, and he had been very greatly impressed by the great changes that were visible with regard to machinery, crops, and other agricultural matters. This had naturally made him think of the pioneers, such as Dr. Voelcker, who had started this great work of agricultural research and education in India. He had been impressed by the magnificence of the buildings which the Agricultural Departments all over India had managed to secure. The great need that was expressed everywhere was for the men to do the work. He had come to the conclusion that this great need of men must be due either to technical agriculturists being rather a backward lot or to the very great difficulty of the problem. It was not for him to say which explanation was the true one.

He had been told by authorities in India that while it was possible to get engineers and forest officers, great difficulty was experienced in getting agriculturists of the right type. This seemed to point to the subject as the difficulty.

MR. JAMES F. DYER, C.I.E., Commissioner, Central Provinces, said Dr. Clouston had emphasised the purely agricultural recommendations of the Report and had said much less about those recommendations which had reference to the mental outlook of the cultivator. He desired to associate himself with what Sir Reginald Craddock had said. Under present-day conditions in India there seemed to be a very grave danger that the interests of the actual cultivator would be sacrificed to those of the rent receiver. In his own Province he felt it was not much use talking about synthetic manures when the natural manure of the country was going to waste in every village. He found there was a close correlation between the use and demand for manure and the percentage of boys of school-going age going to school. In his Province one child in four died in its first year of life; that appalling fact implied a general state of debility which it was terrible to contemplate. Until they could get the cultivator educated and in better physical condition a great deal of the teaching of the Agricultural Department must fall on deaf ears. In the Central Provinces the Agricultural Department knew a great deal more than it could induce the cultivator to adopt in the next generation. Education and public health work involved the spending of money. In the Central Provinces there was a population of about 15,000,000, while the Provincial revenue was a trifle over £4,500,000. Until the problem of supplying the necessary money was faced, a great deal of the teaching of the Agricultural Department must be lost.

DR. H. H. MANN, D.Sc., F.I.C.I., F.L.S., late Director of Agriculture, Bombay, said he found himself one of four veterans who were present at the first meeting of the Board of Agriculture in 1904. The Report of the Commission had been somewhat of a disappointment to most of the workers in the Agricultural Departments in India; it said some very good things, but did not help them on precisely those points where they wanted help. There was, however, unanimous agreement with the recommendation to set up an Imperial Council of Agricultural Research; that was a step in the right direction which was almost certain to lead to great developments. That Council had already had an excellent effect. The Commission had not laid sufficient stress on the fact that the development of agriculture in India lay in the development of the cultivator; it was the man who drove the plough upon whom agricultural improvement depended. He had had an experience of village life in India which he might describe as "extensive and peculiar." In the Bombay Deccan, which he knew best, the problem was not that the people did not know; they, in fact, knew a great deal more than they were given credit for, and if given the opportunity they would go a great deal further than anybody knew or thought. When people had been underfed for generations, were the victims of disease, and while the chances of the death of their cattle in any one year were about 20 per cent., could one be surprised to find little enterprise among them? Until the people were improved, improvement in agriculture must of necessity be very slow. In the Deccan he had found that 50 to 70 per cent. were living below their own standard of life, *i.e.*, were not able to supply themselves with what they themselves considered to be necessary. An old civil surgeon had told him that the babies born in the rural tracts of India were several pounds lighter than the babies born in other parts of the world, which was to be accounted for by systematic under-feeding for generations. The Indian agricultural problem must be looked at, primarily, from that point of view rather than from the angle of merely technical improvement, however important the latter might be.

MR. J. E. WOOLACOTT, late Editor the *Pioneer*, said that in putting before his readers in India the problems of the peasantry he had received great assistance from Dr. Cleuston.

MISS M. ASHWORTH, late Inspector of Schools, Bombay, associated herself with what Dr. Mann had said. It had been part of her duties to rouse women and get them interested in education. She had found this to be an impossible task; the women had not the energy or vitality to care for education. The women teachers in the Bombay Presidency were entitled to a pension on retirement at 55 or 60 years of age, but during a period of 20 years not a single woman had lived to enjoy that pension. That indicated the under-vitalised condition of the women of India. The hope for the regeneration of India lay in the better feeding of the peasant.

MR. R. à-ABABRELTON said that while he had never been in India, he had known many Indians in Natal who had told him that the Indians in India were underfed; they had, however, expressed their appreciation of what the British Government had done for India both by the preservation of law and order and in other ways.

SIR PHILIP HARTOG, C.I.E., said that as late Chairman of the Education Commission he wished to express his deep sense of obligation to the members of the Agricultural Commission for those portions of their report which dealt with education, which he thought were admirable.

The meeting then concluded with a vote of thanks to the lecturer.

NOTES ON BOOKS

ANCIENT CHURCH CHESTS AND CHAIRS IN THE HOME COUNTIES ROUND GREATER LONDON. By F. Roe. London: B. T. Batsford. 21s.

On the 31st December, 1199, Pope Innocent III is said to have ordered the bishops all over Christendom to place in their churches a hollow trunk fastened with three keys. One key was to be kept by the bishop, one by the parish priest, the last by a worthy layman, and the purpose of the chests was collecting alms for a new Crusade. Now hollow trunks would not have been grand enough for prosperous parishes, and simple chests of this kind had been made before and were made long after the Fifth Crusade, so when we see one we may not straight away conclude that we have a crusader's chest before us. The antiquarian is apt to value associations more than anything, and is often too ready to persuade himself that an interesting story is more than half the value of an old piece: how sad, then, if the old piece is not what he believes it to be!

Mr. Fred Roe's learned book will help to put amateurs and collectors right on most points connected with old chests and chairs. He is a draughtsman, and has supplemented the photographs with which his book is illustrated with drawings of his own. Observe that he deals with the Home Counties: it is always most gratifying to be reminded that London has not sapped all the life, and bought up all the memorials, of the neighbouring districts. Messrs. Batsford have produced the book with their usual care.

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No. 4052

FRIDAY, JULY 18th, 1930

VOL. LXXVIII

*All Communications for the Society should be addressed to the Secretary, John Street
Adelphi, W.C.2.*

NEWS OF THE WEEK

Art Galleries.—CONTEMPORARY FRENCH AND ENGLISH PAINTINGS. SAVILE GALLERY, BRUTON STREET, W.1.—This exhibition is choice, but too small to be representative; we must enjoy it without seeking to draw international comparisons.

Of one thing there is no doubt, the best art of to-day in Western Europe is spontaneous and vital. There are painters, both in England and in France, who, though their names may be unknown to the general public, have a full measure of originality and power to express it.

Take Gen Paul. Here is a painter who can give us the *essence* of a visual situation. Number 9, *La Gare de Montfort* is a case in point. Monsieur Paul may have rushed at his canvas with brushes dripping with paint; nevertheless on tearing himself away he has left an *experience*; a concentrated impression of a railway station, with porters, travellers waiting, gleaming lines and a train puffing into sight. This is a higher sort of representation.

Monsieur Souverbie has a different talent. He offers us a key to his outlook in the picture called (very significantly) *Homage à Poussin*. Here, adapted to the sensibilities of our epoch, we find the classical tradition continued. Suave forms, human and inanimate, fill out the canvas. The colours are purposely chilled. A little trick of M. Souverbie's that seems to be justified by results is the use of a kind of *sgraffito*, to get fine white lines threading in and out of the impasto.

Monsieur Quizet's open-air scenes are pleasing in a quiet manner; there is a small Braque, less simple than it looks, and some Dufys that perhaps hardly convey a true idea of the painter's talent.

As for the British artists—the first picture by the door is Duncan Grant's *Vineyard in Provence*, and this is a host in itself. Brilliant sunshine appears to

gleam on fields and horizons to which Nature never brought a more exquisite company of colours. If Nature imitates art, as Oscar Wilde said she did, she will now have to exert her powers of mimicry to the full.

Mr. Sickert is less worthily represented than Mr. Grant here, or than he himself is at Tooth's. *Head of a Woman* by Mr. W. Roberts is interesting, less doctrinaire than his usual products. The visionary, or occult, pictures by the late Charles Sims are bound to attract attention; but from the point of view of art they are to the British team what a "tail" is to a cricket eleven.

BRITISH PAINTINGS, 1900-1930.—TOOTH'S GALLERY, BOND STREET, W.1.—Two outstanding pictures by themselves make a visit to this exhibition worth while. They are Duncan Grant's scene in Venice, and Richard Sickert's picture of the interior of a room in which a man is sitting on a bed, and a nude woman by a washstand is illuminated by a beam of sunlight. The technical brilliance of this last is delightful. The beam of light dances into the gloomy room and fills it with a thousand suggestions of pleasure and irony; outside, the whole world is implied, whirling about its business.

The other Sickerts are also fine, the other Grants not quite so much above the average. Augustus John's portraits are solid chunks of some of the qualities that go to making up human nature. Paul Nash's mannerisms appeal to a rather special taste; the same is perhaps true of Matthew Smith's insistence on red and orange.

PROCEEDINGS OF THE SOCIETY

TWENTY-SECOND ORDINARY MEETING

WEDNESDAY, MAY 14TH, 1930

SIR EDWARD DAVSON, BT., Deputy Chairman, British Empire Producers' Organisation, in the Chair.

THE CHAIRMAN, in introducing the Lecturer, said that Mr. Douglas had a very intimate knowledge of the rice industry. He had visited all the great rice growing and rice milling countries of the world, such as China, India, Ceylon, Burma, Java and the Phillipines. He had also carried out special rice investigations in Italy and Spain, and had investigated rice milling conditions in France, Holland, Germany and Canada. Recently he had been commissioned by the Government of Egypt to go out there and examine and report on the cultivation and treatment of rice in that country, while in the last few months he had been commissioned by the Empire Marketing Board to visit British Guiana and Trinidad and report upon the conditions of rice growing there. He (the Chairman) thought he had said enough to show that Mr. Douglas must be a master of his subject.

The following paper was then read:—

THE CULTIVATION AND PREPARATION OF RICE

By CHARLES E. DOUGLAS, M.I.Mech.E., M.I.Struct.E., A.M.I.Pet.T.

It is a rather trite observation that most of us are relatively ignorant as to the origin of many of the ordinary commodities with which daily use makes us familiar ; such ignorance is probably still more pronounced when it relates to the processes through which any given commodity passes before we meet with it in the shop or in the home.

This obviously applies more especially to material not produced or manufactured in our own country.

The successful cultivation and preparation for the market of any one of such common commodities as Sugar, Tea, Coffee, Cocoa, Tapioca, Sago and many other food-stuffs in daily use in every household, usually involve highly specialised knowledge, together with the use of specially designed expensive machinery.

Rice is no exception to this rule : much skill and experience are required for its satisfactory preparation as a high class marketable product.

To deal exhaustively with the subject is not possible within the limits of a lecture of this nature, especially when one considers, first, the enormous area of the world's surface on which rice is cultivated and, second, the inevitably great number of clearly defined varieties resulting from such widespread cultivation.

Roughly speaking, the Tropic of Cancer is the centre line of the great mass of the world's rice cultivation, whether in the Eastern or the Western Hemisphere. Yet rice grows freely as far North as Manchuria, about 45° North of the Equator, as well as in New South Wales, at some 35° South of the Equator.

Even in Europe it is extensively cultivated round Valencia, in Spain, and in Lombardy, Italy, between 40° and 46° N. ; while in the United States of America the principal rice-producing States, Carolina, Georgia, Texas, Louisiana, Arkansas and California, all lie between the parallels of 30° and 40° N.

The mass rice production of the world is concentrated in British India and in China, the combined total of these two countries probably reaching 100,000,000 tons per annum. We will deal more fully with the production of different areas later.

The origin of rice is wrapped in mystery. It has been cultivated alike in India and China from immemorial times, though which country can lay claim to be the original source of rice is outside present-day knowledge. There are said to be definite records of the cultivation and use of rice in China in connection with religious ceremonies as far back as five thousand years ago, and it is well authenticated that rice and its cultivation have for many centuries borne a special significance in such ceremonies in different parts of the East.

It is not so long ago since, in our own country, the significance of the often misguided distribution of rice at weddings was lost in the embarrassing inflection caused by confetti.

Rice is one of the cereals or grasses. There are two main species botanically

known as *Oryza Sativa*, which is the common rice of commerce, and *Oryza Glutinosa*, which is rarely cultivated, owing, as its name indicates, to the sticky coherent mass resulting after cooking.

There are also wild rices—probably descendants of the original rice which came under cultivation at some distant period in human history ; but these are of no practical interest.

It is beyond our scope to-night to do more than touch on the fact that there are some five or six thousand botanical varieties of rice in the world.

These are distinguished by definite characteristics such as the colour and surface of the *paleae*, which form the husk ; the presence and length, or total absence, of awns ; the length, girth, and general form of the grain, with and without the husk ; the time required for florescence and growth ; and other features which are of purely academic interest.

Rice is an annual, and the full-grown plant usually ranges from twelve or fifteen inches to four or five feet high. There are also giant rices which grow to a height of fifteen feet and over, but the appearance of a normal field of rice is similar to that of any other well-known cereal, such as wheat, barley or oats.

The leaves are long and delicate and of a beautiful green colour when young. The flowers appear as single-flowered spikelets, but only open for a very short time during the forenoon for several days, about seventy days after planting. Some varieties have no awns at all, others have awns of about the same length as the grain itself ; in still other varieties, the awn may be four or five times as long as the grain.

The presence or absence of awn makes no difference either to the commercial or to the food value of the rice ; some of the choicest Egyptian varieties have long awns. Such awns, being wiry and sharp, are often considered to protect the maturing grain from the depredations of birds, but they are a source of annoyance to the miller, as they are not necessarily removed by threshing.

Turning now for a minute to the incidence of rice cultivation, we have already seen that British India and China are by far the largest producing countries.

Speaking in terms of cleaned rice, *i.e.*, rice threshed and husked, but not polished, the production of India and Burma in any normal year may be taken as round about thirty-five million tons, derived from some fifty million tons of paddy or rough rice in the husk.

It may be convenient to state at this point that, roughly speaking, and covering a wide range of rice varieties, the weight of the husk is twenty per cent. of the weight of the complete grain with the husk still on. If one adds another six per cent. for dead grain and dust, it may be assumed that out of every hundred tons of paddy, some seventy-four tons of rice and feeding stuff is recoverable. This point will be dealt with later.

Following some way behind the production of British India we have that of the Japanese Empire, including Formosa and Korea, totalling some fifteen million tons of paddy in a normal year.

The Netherland East Indies, including Java and Sumatra, come next with some six million tons ; then French Indo-China, including Cochinchina, Annam, Tonkin, and Cambodia, with approximately five million tons ; and finally, among the great rice countries, Siam, with about three to three-and-a-half millions tons. Omitting China, for which, owing to its size, and to the lack of reliable statistics, it is difficult to obtain even approximately correct figures, these five Oriental countries between them are responsible for some eighty million tons per year, or ninety per cent. of the world's production. As an interesting comparison, it may be said that—again excluding China—the average world production of wheat is about 115 million tons, of which India contributes $8\frac{1}{2}$ million tons.

No other country in the world even approximates to the production of Siam, the smallest producer of these five countries ; there is a great gap between the three or three-and-a-half million tons of Siam and the seven hundred thousand tons of rough rice produced in an average year in the United States of America. The Philippine Islands, Egypt and Madagascar normally run the production of the United States very closely. Even Europe makes a good showing with some four hundred and fifty thousand tons of paddy in Italy and two hundred and fifty thousand tons in Spain.

Brazil and Persia produce about as much rice as Italy, while Transcaucasia and Turkestan used to yield about the same quantity as Spain.

The figures for the normal production of British Guiana, Peru and Mesopotamia, from seventy thousand to fifty-five thousand tons per annum, look almost insignificant when compared with these larger rice countries ; yet a recent visit to British Guiana revealed a considerable proportion of the cultivated area of that Colony to be sown to rice.

When one realises the fact that in one year there may be thirteen million acres under cultivation in Burma alone ; perhaps thirty-five or forty million acres in and around Bengal ; and some twelve million acres in the Central Provinces of India, one begins to realise the magnitude of rice cultural operations. The total area under rice in the United States of America is approximately one and a quarter million acres.

Again by way of comparison, the total area under *all* cereals in Great Britain during 1929 was about $5\frac{1}{2}$ million acres.

The yield of rice per acre is far from uniform throughout the world ; it varies within wide limits.

The average yield in India and Burma runs from twelve hundred to fifteen hundred lbs. per acre ; in Egypt and in British Guiana, on the other hand, the average runs as high as three thousand lbs. per acre ; while in various not specially selected or specially cultivated areas in Japan, Spain, Italy, Egypt and British Guiana, yields of as high as six thousand five hundred to eight thousand lbs. per acre have often been attained.

Average yields in the United States, where cultivation is carried out on the most modern lines with up-to-date machinery, run about two thousand lbs. per acre.

Now let us consider for a moment a few of the leading types or varieties of rice grown or particularly worth cultivating, and the reason for their selection.

All rices are of practically equal food value if treated in the same manner and to the same extent. It is true that in certain parts of India, for example, natives who are accustomed to eat certain local varieties of rice may suffer from intestinal troubles if moved to another district and compelled to eat the rice grown there.

The writer had occasion some years ago to employ native engineers from Burma to erect a rice mill in Kedah, Malaya ; as the local Malayan rice was stated to cause them considerable stomachic discomfort, other rice had to be purchased for them. Rice, after all, is the staple, in many cases almost the only, food of nearly half the world's population, while it is probably correct to say that, prepared in some way or another, it is consumed in nearly every household in the world, once or twice a week.

The bulk of the rice produced in these great countries is consumed locally the quantity exported from them is a relatively small percentage of their total production, although the surplus available for export from Burma alone last year was nearly three million tons.

While the local native consumer, whose principal food is rice, may be highly critical as between one local variety and another, the sale of rice among those to whom it is merely a subsidiary food is governed by other considerations.

Apart from East Indians, who prefer their rice treated in a special way—known as parboiling—before it is milled, and certain Levantine consumers who draw their supplies from Rosetta, Egypt, where the rice is prepared by being pounded together with a mixture of gypsum and rock-salt, European and Anglo-Saxon races generally purchase their rice on appearance only.

There are several recognised commercial types of rice in the world's markets, and these may be roughly divided into three classes :—

1. The relatively long and bold type known as Carolina Rice.
2. The long, thin, cylindrical grain known as Patna ; and
3. The short, stout grain known as Spanish-Japan.

This is a rough classification and there are intermediate types. Some Peruvian, Madagascar and Italian rices might almost be termed super-Carolina types.

Siam Garden rice and some of the Burma, Cochin-China, and British Guiana varieties are difficult to distinguish from Patna ; while rice from Japan, Egypt and Spain is obviously derived from a common Far Eastern stock.

Burma rice is known and appreciated all over the world ; its food value is not materially different from the higher priced and so-called choice rices.

These typical grains are shown, magnified, with and without their enveloping husk.

By preparing a diagram, as shown, in which the length and width at the middle and ends respectively represent the length, width and thickness of a selection of grains of standard type, the distinction between these at once becomes apparent. If such a diagram is drawn from actual measurements of a number of grains of one

pure strain, it is remarkable how the shape of the diagram remains practically constant for any one such type.

Now this brings us to a most important consideration, that of seed selection.

Where rice is being produced literally in millions of tons per annum for local native use only, it is neither practicable nor necessary to insist on pure strains. The small cultivator has not the money, nor is his market critical enough for such discrimination; it is, after all, the sum of the yields of many thousands such small farms which go to make the enormous totals produced in India and Burma, Japan, French Indo-China, Java and Siam.

When, however, we are dealing with choice high-priced varieties, for sale in critical European or American markets, it is essential that specific types be adhered to, even if several different varieties, closely resembling each other in form and character, are eventually drawn on to yield a bulk supply. The purchaser of choice high-priced Carolina rice will not, for example, tolerate an admixture of long, thin and short fat grains. The buyer of Patna rice will insist on long, uniform, cylindrical grains. Deviation from standard type means a lower selling value. Moreover, some varieties are more susceptible than others to breakage during milling, and breakage means definite loss with consequent reduction in price. Therefore it is increasingly recognised that, as far as possible, and certainly for the cultivation of choice varieties, special efforts must be made to ensure propagation of pure unmixed seed.

Rice culture stations have been established for some years now, and are being extended as opportunity and means permit in most rice-growing countries; and while the difficulty of extending such schemes is obvious in countries where production runs to enormous figures, the problem presents relatively little difficulty where production is limited to five or six-figure total crops per year, particularly where ample technical supervision is available, as, for instance, in the United States of America, in Italy and in Spain.

It is obviously useless to start distributing small quantities of seed. It is hopeless for a farmer who has one thousand acres under cultivation to be allotted selected seed sufficient only for two hundred acres, if he is compelled to make up the deficiency with any other seed he can get hold of. The correct procedure is for the Department of Agriculture concerned to propagate pure seed; to distribute the resultant pure grain to seed farms, in different localities, under adequate supervision; and for such Government farms to propagate, store and distribute the grain to selected cultivators who may be relied on to continue the good work.

There are responsible milling companies who are prepared to pay a premium for bulk supplies of uniform paddy, because their milled output will command a higher price on account of its uniformity and better quality generally.

Apart from planting pure line strains, much can be done by means of appropriate and simple machinery to eliminate defective, mal-formed and unsuitably-sized grains from the amount reserved, as seed, from a previous crop. By such means

it is becoming more and more possible to improve the general standard of grain in any given area of reasonable size.

A word of warning is important here. Rice seed soon loses its viability or germinating power. It is unwise to store it as seed for longer than, say, twelve months. The germinating power declines rapidly thereafter. Seed stored for three years gives extremely disappointing results.

There is another point to watch : in certain countries rice is wet harvested, and requires drying before it is fit to store. The moisture content of the grain varies considerably in different countries. In Spain, for example, it may run to 25 per cent., while in Italy it may be as high as 40 per cent.

The commonest method of drying paddy is to spread it in the sun for a day or two ; but in certain cases mechanical dryers are employed, utilising hot air, steam or direct hot gases for the purpose. The germinating power of the seed may be rapidly destroyed if the grain is heated beyond a relatively low temperature.

AGRICULTURAL OPERATIONS.

Rice is essentially an aquatic plant and must have an ample and regular water supply for its full cultural development. It must be grown on ground possessing a substantial clay subsoil which will definitely prevent loss of water through drainage or seepage.

Rice grows freely in countries where there is a definitely marked and sufficiently prolonged rainy season, without any special provision for other irrigation. Or again, it is grown with marked success in a country like Egypt, where there is no rainfall at all during the growth of the plant, but where a highly developed irrigation system exists.

There is a considerable difference of opinion as to the quantity of water required for adequate irrigation. A suitably controlled supply is of more value than an unlimited amount of water. Heavy rains and overflowing by irrigation may be seriously injurious to young plants. It will usually be found that an average depth of five or six inches of water on the fields gives most satisfactory results. This depth is retained by bunds or levées which should be both low and broad to permit of access between the fields. The fields are usually flooded to a depth of two or three inches before ploughing and are then ploughed and harrowed and levelled under water. In many cases the water is then run off the fields, which are allowed to settle for a time and then re-ploughed and re-levelled preparatory to sowing.

In the East and the Far East ploughing is done by buffaloes or by bullocks drawing a light native plough which only penetrates a few inches into the soil. The same beasts are used for harrowing, and also for levelling by drawing a heavy beam of wood over the surface of the ground.

In America, and now gradually increasing in other countries, ploughing and harrowing are being effected by light, modern implements drawn by mechanical tractors. Having regard to the essential presence of clay in most rice lands, the



Sowing Rice Broadcast on levelled field covered with water

use of tractors is not always practicable, apart from their cost, which is prohibitive for the small cultivator.

Where the ground is very heavy and wet, caterpillar tractors appear to offer a reasonable solution.

When the soil has been puddled it is ready for the seed which, in many countries, is germinated just before being sown. This is effected by placing the seed in bags in water till it is thoroughly soaked. The bags are then taken out and covered over with mats or leaves, which cause the seed to heat and germinate.

After the rice has become well established on the fields, water is gradually admitted, and is maintained, if possible, at a suitable level until the grain is almost ripe. It should then be run off and the field allowed to dry out to permit of satisfactory harvesting.

The foregoing simple description presupposes a wide area of level field such as is commonly met with in India, Burma, Siam, Indo-China and Egypt; but cultivation in hilly countries like Japan and Java, the Phillipines, Malaya, Ceylon and Madagascar, presents another picture. Rice there must often be grown on the side of a hill by terracing to ensure sufficiently level areas to retain water during growth. The labour involved in this method of cultivation is considerable, as in some cases observed by the writer, the width of these terraces is measurable in inches, certainly not more than feet, rather than yards.

The effect of such cultivation is noteworthy. The contrast of the beautiful green of the young rice against an otherwise dark hill-side or on red laterite soil is remarkably picturesque.

There are two methods of dealing with rice in the early stages. Either the seed is broadcast direct on the fields and allowed to continue its growth where it falls,

or it is broadcast in nurseries and transplanted into the fields when it is about one month old.

These two methods are sometimes adopted within relatively near areas, as, for instance, in British Guiana, where one district broadcasts or shies while another transplants. Egypt broadcasts entirely and gets heavy yields, but in general it is found that transplanting, although arduous, gives better results and more uniform crop. Usually in the United States the seed is drilled. There is little doubt but that the spacing of the plants, whether effected by drilling or by transplanting, allows more breathing space, as well as permitting of easier and more effective weeding between the lines; there is, moreover, a definite saving both in seed and water, and damaged or defective seedlings can be eradicated.

In this connection, a most interesting article appeared in the April number of the *American Rice Journal*, in which an account is given of sowing rice broadcast by aeroplane. A considerable area, in which the young rice was already well established, had been devastated by birds so that re-sowing became necessary. Owing to the lateness of the season it was decided to try the experiment of rapid sowing by aeroplane and this was satisfactorily accomplished at the rate of 212 acres per day.

The 'plane made 160 trips, travelling 800 miles, and sowing 48 tons of seed — surely the most modern example of up-to-date methods applied to the oldest of industries.

The life of a rice plant varies greatly according to the variety grown. *Sabaini* rice, grown in the Fayoum in Egypt, is supposed to mature in seventy days; hence the name, from the Arabic word for seventy. On the other hand, there are rices which require precisely three times as long for their full cultural development. A good average period is one hundred and forty-five days from sowing to harvest.

The problem of manuring rice fields is now receiving a great deal more attention than formerly. It is one which depends on many factors, such as soil characteristics, rotation of crops, and economic conditions. In the East and the Far East there are literally millions of small cultivators who cannot afford to purchase artificial manures, and who seem unable to collect sufficient farm manure to make its application worth while. Green manures, particularly the cropping of legumes like soya beans, berseem (Egyptian clover), and allied plants, are valuable. In Japan the fullest possible use is made of all sorts of farmyard and domestic refuse, green branches and twigs of trees, and all sorts of rubbish compounded together and applied with remarkably satisfactory results as to yields.

In Egypt the usual custom is to sow berseem or clover among the grain while the latter is ripening; after harvesting, the berseem is first cropped—often more than once—and then cattle are admitted to the fields to feed on the berseem, and to tread in the roots of rice and clover alike.

In the Essequibo district of British Guiana, on the other hand, two heavy crops of transplanted rice are taken off the same field each year, without either rotation, fallow or manure.



Typical Good Rice Field ready for Harvesting.

As far as chemical manures are concerned, and subject to soil requirements, it is usually found that phosphates suit rice better than nitrates ; but this is obviously a very general statement on which it would be erroneous to base expectations without exact knowledge of local conditions.

HARVESTING.

The paddy is ready for harvesting when the panicles, or heads, have attained a rich golden colour and have commenced to droop gracefully.

As already mentioned, the fields should be freed from water two or three weeks before the grain is cut. While reaping and binding machines are commonly used in highly developed agricultural areas like the southern states of the United States of America, the vast majority of the world's rice crop is reaped by hand, sometimes with a long stalk, sometimes by cutting close up to the panicle or head of grain.

In Japan the straw is used for making sandals, for plaiting hats, for thatch and for other purposes ; in some other countries it is left to rot on the fields, or is raked into heaps after threshing, and burnt.

There appears to be considerable economic waste here. Rice straw may not be a particularly valuable feeding stuff for cattle, but it possesses considerable potentialities as regards the manufacture of paper, of cellulose, and for other purposes.

After the grain is cut it should be stacked loosely on dry ground for at least

two weeks, and should preferably be capped for protection against rain or heavy dew, as well as excessive sun heat.

Threshing may be effected by three well-known methods: either by beating the long-strawed grain by hand over a table or over a board set on edge; by treading out with cattle; or by threshing machines.

The first-mentioned process is laborious and expensive in relation to results, but gives clean grain. The second is the most common method throughout all native countries, and a very dirty and unsatisfactory product is the usual result. The mechanical thresher is the ideal method; although the cost may well be beyond the reach of the average small Eastern cultivator, the adoption of a communal thresher is not impossible, while Agricultural Departments or Boards may be in a position to give grants-in-aid to encourage and facilitate the yield of a better-quality product.

GRAIN CLEANING.

Where the paddy is threshed by cattle, some method of subsequent mechanical cleaning—apart from milling—is almost essential. No matter what precautions are taken, it is impossible to prevent the grain being fouled by animal excreta and mud. Moreover, there is inevitably present a fair percentage of damaged or immature grain.

It may be considered a reasonable enough proposal to pass all this on to the purchaser; but, judging from a wide experience in many rice countries, the place to get rid of this rubbish is on the field and not in the mill, where at times an almost intolerable nuisance is created by the dust from the dirty paddy.

THE TREATMENT OF THE PADDY.

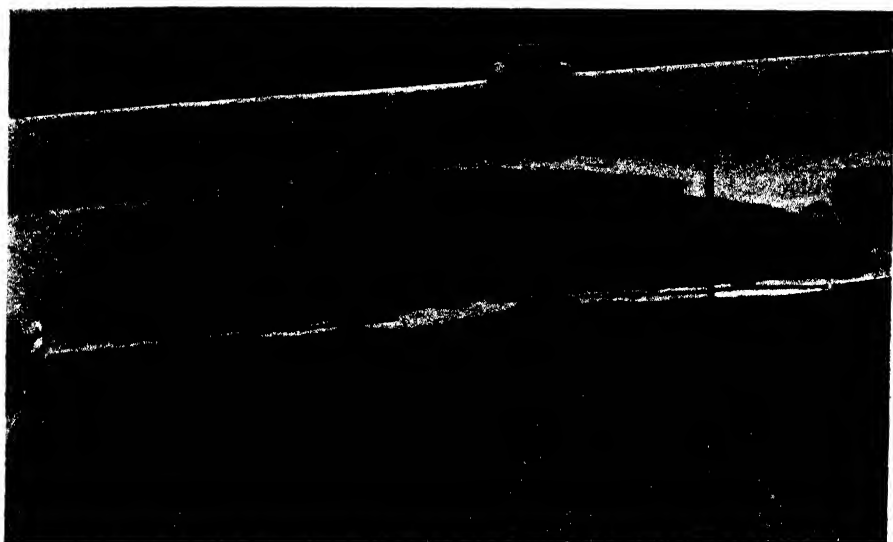
The threshed grain is usually collected from growers by brokers who, in turn, sell to merchants or direct to millers.

Paddy is sold both by measure and by weight, but neither method can prevent all too common adulteration.

It is therefore necessary to submit the grain to further cleaning on arrival at the mill. This should be done in a part of the building adequately screened from the rest of the mill on account of the dust.

As already stated, a considerable percentage of the paddy grown in India, or grown and prepared in other countries for consumption by East Indians (as, for instance, East Indian labour on Malayan rubber estates, in South Africa, and in the West Indies), is specially treated before being milled.

The grain is steeped for some thirty hours in tanks or vats containing water at a temperature varying, according to circumstances, from 33° to 47° Cent. The water is thereafter run out of the tanks, or the steeped paddy is removed from them. It is then subjected, either in the original tanks after the water is run off, or in separate vessels, to the passage of steam at or about atmospheric pressure for a period of ten or fifteen minutes. When this—the actual parboiling process—



Spreading Wet Rice on Sun drying Floors.

is completed, the grain is spread out on cement floors to dry in the sun. It is usually exposed for two consecutive days, the grain being turned over periodically by many bare feet shuffling through it.

In many places provision must be made to heap and cover the drying grain, either by mats or movable sheds, in case of sudden showers or heavy dews.

Many experiments—they have hardly even yet emerged seriously beyond this point—have been made to treat wet paddy by so-called mechanical dryers. If the grain is only superficially wet due to rain-fall, such methods are not impracticable, as is evidenced by their regular adoption in Italy, where the moisture content, on harvesting, may be as high as 40 per cent., and in the larger Egyptian mills. It has, however, so far proved both difficult and costly to dry the thoroughly soaked parboiled paddy, in bulk, by such methods. It is certainly far too expensive a system to be adopted by small farmers, and sun-drying still persists in spite of possible climatic interruptions.

The question naturally arises as to the reason for this rather cumbersome and costly process. In the first place, it has the effect of so opening up and loosening the husk that the grains can be shelled with very little trouble. Secondly, the process toughens the rice grains to an extraordinary extent, so that a much smaller percentage is broken during milling. In the third place, the grain keeps better after milling and after cooking than does un-parboiled rice. Finally, there is no doubt that rice so treated is definitely more nourishing than white-milled rice. The reason for this is that, owing to the toughening of the grain, less of the outer layers of the kernel, which are rich in anti-neuritic vitamin B, is removed by milling, and is, in fact, absorbed, to a certain extent at least, into the endosperm or kernel.

RICE MILLING.

The primitive native mill is of very simple construction.

The paddy may be hulled or shelled—

(a) By being beaten out by a heavy wooden mallet on a block of hard wood ;

(b) By being pounded in a wooden or earthenware mortar, or in the hollowed stump of a hardwood tree, the pestle being a bamboo pole bound with iron hoops ; or

(c) By means of a long bar of wood pivoted like a see-saw, one end being provided with a vertical hammer-head or tup, and raised and lowered by the simple process of the operator stepping on and off the other end. In this case the mortar containing the paddy is often nothing more than a hollow scraped in a hard mud floor.

Primitive and slow as these methods are, they are fairly efficient, and do not damage the grain so much as one might expect.

The contents of the mortar, consisting of shelled and unshelled grain and loose husk are then removed and tossed in the air. Husk and dead grain are thus winnowed away, and the more solid grain is collected and separated as to shelled rice and unshelled paddy. The latter is returned to the mortar with a fresh supply of paddy.

Even to-day a mechanical development of this primitive process is in operation both in parts of Malaya and of Egypt. Instead of employing hand labour, however, the pestles, which are relatively heavy vertical beams of wood shod with iron, are raised and lowered by a revolving cam shaft, falling on the paddy contained in heavy metal or stone mortars.

While these simple processes meet the requirements of local markets, it is clear that they are hopelessly inadequate to deal with the competitive production of large quantities of rice for export.

There have now been evolved, as the result of years of experience, certain more or less standard types of machines which are known and employed all over the world. The simplest machine of all is that known as the Engleberg type of huller, originally designed and built in America, but now made and sold in nearly every rice country. It is compact, cheap and easily installed, and is admirably adapted for milling tough parboiled grain which can stand more punishment than raw rice.

This machine gives a remarkably good sample, but it has three disadvantages : it requires considerable power in relation to its output ; it tends to break an undue proportion of unboiled rice, especially if the grain is long and thin ; and the otherwise marketable grain is mixed with valuable bran and meal, as well as with broken husk, to such an extent as to render their separation and useful recovery impossible without the intervention of further suitably designed machinery.

The modern method of milling, which is readily applicable to any quantity of rice, whether raw or parboiled, from three or four hundredweights per hour to one thousand tons a day, consists in the employment of certain specific machines for specific purposes. These may be briefly described as follows :—

1. A machine consisting of a combination of sieves and fans to free the incoming paddy from rubbish, straw, stones and dust.
 2. A machine consisting of an upper fixed disc and a lower revolving one, to shell or hull the paddy, removing the outer husk from the kernel.
 3. A machine—again consisting of sieve and fan—in which the total product of the sheller is subjected to a current of air to remove the husk (which then becomes available as a valuable fuel to raise steam to drive the mill) as well as to take out any particles of rice broken during the shelling process. Such broken rice makes valuable chicken feed.
 4. A machine for separating the shelled rice from the still unshelled paddy. Owing to inevitable differences in size of the grains, a certain proportion of the paddy is not hulled during its first passage through the sheller. This separating machine takes advantage of the difference between the density or specific gravity of a grain of paddy and a grain of rice, the latter being, bulk for bulk, heavier than the former. The machine rejects the paddy on one side, discharging the rice on the other; the paddy is collected and returned to the sheller.
 5. A machine consisting of a cone revolving at a high speed within a wirecloth casing, for pearling or whitening the rice, by removing from the kernel the cuticle or outer layers, which are usually somewhat coloured. These outer layers constitute the meal or bran which, together with the germ, contain most of the essential nourishment and vitamin contents of the grain, including a definite quantity of phosphorous pentoxide, P_2O_5 , and from fifteen to eighteen per cent. of oil.
This meal or bran forms a valuable constituent of cattle feeding stuffs.
 6. A machine to separate the whole and larger broken white grains from the smaller broken.
 7. In certain cases, a machine to brush or polish the white rice in order to produce a better superficial appearance.
 8. Also, in certain cases, a machine in which the whitened polished rice is rotated together with an admixture of talc and glucose, which impart an added if entirely artificial brilliance to the rice.
 9. Lastly, a machine again consisting of sieves and fans, for grading and dressing the final whole and broken products according to market requirements.
- There are, in addition, elevators, conveyors and other accessory machines which need not take up our time.
- By referring to the diagram it will be observed that there is practically no waste or loss in a modern mill comprising the above machines or multiples thereof.
- While our diagram shows only one of each type of machine referred to, and these of relatively small capacity, it is interesting to appreciate that there are many mills in which these machines are not only of considerably larger size but are multiplied many times over, in one installation, in order to cope with the huge quantities of paddy delivered daily to these mills from many miles up country.

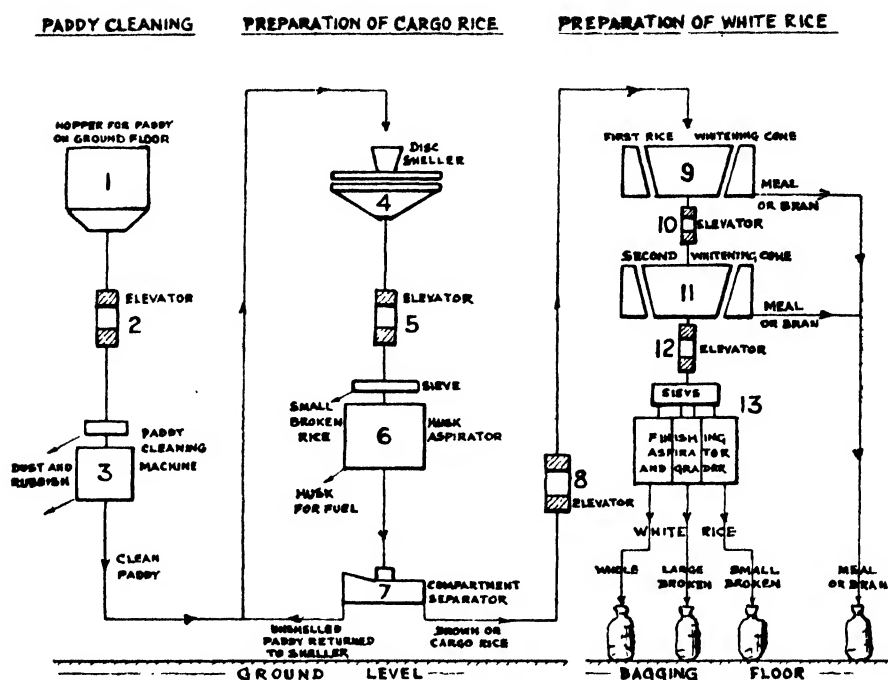


Diagram showing Arrangement of Typical Small Rice Mill.

Husk constitutes twenty per cent. by weight of the paddy, and the whole of this can be recovered and used as fuel. It is with such fuel alone that the large mills in Burma and Indo-China, which are the largest mills in the world, treating anything from five hundred to fifteen hundred tons of paddy per mill per twenty-four hours, and requiring anything from five hundred to two thousand horse power per mill, are operated.

Deducting this twenty per cent. and allowing some six to six-and-a-half per cent. for waste, the modern mill gives an out-turn or ratio of marketable products to paddy input of seventy-three and a half to seventy-four per cent. The essence of good milling is not only to obtain the maximum amount of marketable products from a given quantity of paddy, but also to secure the highest possible percentage of whole white rice.

While other raw commodities are crushed for the extraction of juice or oils, or ground for the manufacture of flour or granulated products; or treated by biological or chemical processes for conversion into something differing essentially in character and appearance from the original material, the art of rice milling is to produce the maximum number of uniform well-finished whole grains.

Obviously, the higher the degree of milling and the whiter and more polished the finished product, the greater the percentage of broken rice, as well as of bran, or meal, produced. Even the most modern, well-designed and operated machinery

will break a proportion of the grain. If the latter has been carelessly harvested and stacked the breakage will be still greater; but given careful design and attention to detail, combined with proper supervision and adjustment of machinery, the amount of broken grain is remarkably low. In any case, broken white rice has a definite market for the manufacture of alcohol and beer, for conversion into ground rice, and into starch, and it is used in the preparation of pharmaceutical products and face powders.

There are in the East, particularly in Burma, as also in the United States, clearly defined specifications to which various qualities are milled, so that it is possible to contract several months ahead and be practically certain of purchasing ample quantities of any recognised standard qualities at any given date.

While a considerable quantity of rice for export is finished in Eastern mills, large shipments are made of partially milled rice to other countries, where it is milled up and finished to suit local markets.

There are, for example, mills in Hamburg and Holland where many thousands of tons, partially milled in the East, are re-milled, polished and re-exported. The same system obtains in other places, such as Havre, Bordeaux, Marseilles, Trieste and Fiume in Europe; in Montreal and Vancouver in Canada; in Buenos Aires and other South American ports, and so on.

At one time there were several mills in London and Liverpool engaged in the finishing of imported semi-milled rice; yet in spite of the fact that so much of that rice is of Empire origin, it seems to be impossible to compete here with Dutch and German white rice mills.

Many of these importing countries impose a relatively heavy tariff on finished white rice; but paddy, as well as merely shelled unwhitened rice, is usually subjected to a merely nominal duty. Consequently there is a considerable and probably increasing trade in what is known as cargo rice, *i.e.*, rice from which the husk only has been removed, but retaining the cuticle, or skin surrounding the kernel under the husk. It is customary to concede that this cargo rice may contain two per cent. of paddy and ten per cent. of broken grain.

While cargo rice is unattractive to look at, it is most valuable as food, and it is pleasant to the taste when cooked.

The highly polished, highly glazed rice purchasable in most shops has nothing but its appearance to recommend it and it is, of course, more expensive than the lower milled grades. The artificial glaze which is added at considerable trouble and expense comes off in the cooking pot, and there is not much left except starch and water.

While highly finished rice is palatable, easily digestible, and forms a common ingredient in European and Western cooking, it is quite unsuitable as a staple diet for Orientals. There is now no doubt that the distressing and often fatal tropical disease known as *Beri-beri*, or *Polynuritis*, is due in a large measure to the consumption of over-milled rice without any balancing ration to compensate for the removal of the nourishment contained in the cuticle and in the germ.

In some Eastern countries one can observe the native mill-workers collecting some of the bran or meal—milled off the rice to render it white—and mixing it with water in order to absorb the nourishment which they would otherwise lack.

It seems equally certain that the consumption of parboiled rice as a staple food, even if unaccompanied by a balancing ration, does not predispose the consumer to Beri-beri.

While the process of parboiling gives a yellow tinge to the milled rice, this practically disappears on cooking. In the West Indies parboiled rice is much appreciated by Europeans and, indeed, preferred to white milled rice, because of its flavour, its greater nourishment and its better keeping qualities.

One word in conclusion, *re* the stowage and storage of rice. On account of its inherent moisture, especially when freshly milled, or partially milled, rice stowed on board ship must have ample ventilation; moreover, it should only be shipped in new bags. Rice stored on shore must be kept in dry, well-ventilated buildings, and even then it is liable to be attacked by weevil.

For good storage the moisture content should not exceed about fifteen per cent., while the ideal for milling is round about twelve per cent.

The rice weevil is a persistent creature. He perforates the kernel and eats away the whole of the inside, leaving an empty shell like a blown egg.

If finished rice is kept in a mill go-down or store, especially in the tropics, it soon becomes liable to weevil attack.

It can be cleaned and freed before shipment by passing it once again over a system of sieves and ventilating fans, which will effectually deal with the insects and the eaten grains.

Alternatively, the stores can be closed as hermetically as possible and then be thoroughly fumigated, either with hydrocyanic or carbon bi-sulphide vapour.

Yet again, weevil as well as fungi can be destroyed by the application of heat at a temperature of round about 55° C., but great care must be exercised in subjecting paddy to such a temperature if any portion of it is intended to be used for seed, as the germinating power will rapidly become destroyed along with the weevil.

While the question of marketing does not perhaps come within the scope of a paper of this nature, it may not be impertinent to suggest that there is perhaps room for improvement in the method by which rice is exposed for sale in stores and shops.

The presentation of suitably milled rice in simple but attractive cartons, together with the dissemination of appropriate literature to popularise its use, might be appreciated by many customers.

The *American Rice Journal* contains, each month, a series of short articles giving suggestions and recipes for the preparation of attractive rice dishes.

The New York State College of Agriculture, Cornell University, acting in conjunction with the Rice Millers' Association of the United States, has from time to time issued pamphlets dealing with the same aspect of the problem.

Rice, as generally served in this country, does not usually form a specially attractive dish. Perhaps, therefore, it is not too lame and impotent a conclusion of the matter to commend this suggestion to those interested in the sale and distribution of one of our Empire's principal and most widely-grown foods.

DISCUSSION

THE CHAIRMAN, in opening the discussion, said that one of the most interesting things about the lecture was that it showed rice cultivation as being an industry of the greatest antiquity—possibly the oldest industry in the world. It had also shown rice in its modern developments, with its mechanisation; and, by telling about rice being sown by aeroplane, the lecturer had shown that, in addition to rice being the oldest, it was the most up-to-date industry; because he could not think of any other industry which had yet used that means.

Rice was the foodstuff of half of the inhabitants of the world. Its annual production was some 60,000,000 tons, apart from China, the production from which, the lecturer had said, was 50,000,000 tons; so that the total production was over 100,000,000. That was very interesting, because he should think it was doubtful whether rice could be considered as one of the best foods for man; it was distinctly less beneficial in value than other cereals owing to its lack of proteins and fats, and was really only suitable as part of a balanced diet. One might ask, therefore, why rice was still the food of half the world? He thought the answer must be, in the first place, that it grew over such a great part of the world, that it was a product which could be grown by the humblest peasant anywhere, and easily; and that, secondly, and more especially, rice was very likeable, easily consumed and very digestible. It had been said that as a nation progressed in civilisation it left one form of food and went on to another. It had been said that people, as they developed, would give up their rice diet and would take to wheat; and, again, as they developed still more, they would cut down their wheat diet and take to meat; and he believed it was now carried a point further, and was said that the most highly developed nations gave up meat and took to fruit. So that it would be seen that in a sense it was a circle, and that we came back, in our highly developed state, to the diet which had been popular in the Garden of Eden!

In the present day those who might be concerned with production in its various forms were aware that almost everywhere we were suffering from over-production. That especially applied to those products which were definitely grown for export. The result was very large fluctuations of price, and possibly the ruin of the grower or producer. Rice was more fortunate in that respect than other industries. The production of rice was 100,000,000 tons. The international trade in rice was 6,000,000 tons. Therefore there was only 6 per cent. of rice which was moved about according to the demands of the markets, and 94 per cent. continued as a staple diet, whatever might happen to price. Owing to that great stability which it had, it was probable that rice had maintained its value in the markets of the world more than any other article.

With regard to rice and its relation to malaria, it had been contended that when people were cultivating rice they were liable to malaria owing to the wet conditions under which they worked. It was argued in British Guiana that during the rice season there was a great rise in the amount of malaria, and that the hospitals were filled immediately after that season. On the other hand, he believed it was contended

that in Italy, where rice had been grown to a considerable extent, there was no increase of malaria among the people who grew rice. He should be inclined to think, as a layman, that it simply meant that when there was a swampy, unhealthy country, and one started rice cultivation with its trenches for taking off water and so on, one probably did something to improve the conditions for health ; but that if there was a country which was comparatively dry, and irrigation was introduced necessary for rice cultivation, and the people were made to work in those conditions, probably it had helped to increase malaria, because it afforded so many breeding grounds for mosquitoes.

SIR ANDREW BALFOUR, C.B., C.M.G., M.D. (Director, London School of Hygiene and Tropical Medicine), remarked that the association of rice with malaria required a good deal more investigation. It was known that in certain places flooded rice fields were associated with malaria, but that in other places, although everything seemed to favour the propagation of the anopheles mosquito, there was no malaria at all. Why this should be so was not known. There had been various theories advanced with regard to the food supply of the mosquito larvæ, determining the larvæ being present in one place and not in another. The possibility of the presence of natural enemies of the larvæ in some places and their absence in others had also been advanced. It might be really a case of the species of mosquito present in the country. In certain places mosquitoes of certain species would breed, and in other places they would not. A great deal, therefore, depended upon the type of anopheles present in the locality. All these things probably had something to do with the absence of malaria in some rice field areas and its presence in others. A remark had been made about putting water on a dry soil. That undoubtedly was sometimes a reason why a heavy incidence of malaria was obtained.

With regard to beri-beri, it was well known that milled rice, highly polished rice, was associated with ber-beri. Whether beri-beri was invariably due to a somewhat exclusive dietary of polished rice was a doubtful point. It was quite possible that there were forms of beri-beri which were not dietetic in origin. This showed how much research had still to be done in tropical medicine. In any case it was not merely a question of eating highly polished rice ; it was a question of a somewhat exclusive dietary of highly polished rice. Some people supplemented the rice with other articles of diet and thereby got a properly balanced diet. It was where there was an unbalanced diet that beri-beri occurred. One method of treating beri-beri in the Philippines was making use of the cuticle of which the lecturer had spoken, which cuticle was used as a drug both for the treatment and prevention of the disease.

There was one other malady which was associated with rice in tropical medicine, and that was epidemic dropsy, which was found in Calcutta and other parts of India, and which was known also in Fiji. It was often confused with beri-beri, but it was probably due to something developing in stored rice. From the hygienic point of view the storage of rice in the tropics was a matter of great importance. When rice was stored under damp conditions some toxic product might develop, perhaps the result of fungus growth. Here again nothing fully was known, but some excellent work was being done by officers of the Indian Medical Service in connection with it. There was undoubtedly something which developed in the rice and might give rise to epidemic dropsy.

One of the troubles of rice from the dietetic standpoint was that it was such a bulky food. That was one of the reasons why little children in the tropics had such prominent stomachs. Also among the native population forms of indigestion were prevalent due to this very bulky dietary.

MR. J. C. McDOUGALL (Deputy Director of Agriculture, Central Provinces, India) thought he was right in saying that of all the rice-producing countries India was the worst; she produced less per acre than any other country in the world. He also thought he was right in saying that the Central Provinces was the lowest producing Province in India, and that the district he was most familiar with was the lowest producing district in the Province. So that it was his lot to represent what was practically the lowest producing rice area in the world. One reason why that district or division was such a low producer was that it was the only division in the Province where rice was grown simply by the broadcast method. In practically the whole of the rest of India it was grown by transplantation. Also the people in the division were extremely backward and not very ambitious. The authorities there were trying their best to improve matters. They had not the advantage, in dealing with rice, which people dealing with other products frequently had; that advantage was the hope of evolving new varieties by hybridisation. There had only been very few examples known of successfully establishing a new variety of rice. The authorities were trying to eliminate the less desirable varieties and to introduce the more desirable. For that purpose they had a number of experimental farms, associated with which were a larger number of seed and demonstration farms, where the seed which was selected on the experimental farms was multiplied and from there delivered to what were called private seed farms; there were several thousands of the latter in the Province. Having carried it so far they then let it depend on its own merit for recommending itself to the cultivators.

MR. E. R. BOLTON remarked that the audience had been told at an early stage of the lecture that all the various forms of rice had more or less the same nutritive value. Shortly after that they had been informed that people who had gone from their native district to a new district had been unable to eat the rice in the new district and had had to get rice from their old district. That showed clearly that it was not a question of nutriment, but a question of some substance which was present in the rice from their own native district and which was not in the rice in their new district. He suggested that a lot of these cereals and natural vegetable products contained substances concerning which we had no knowledge whatever, and which must be considered when the food value of those products was taken into account. That was a thing which he hoped those who were investigating the matter would take into consideration in the future.

THE CHAIRMAN then proposed a hearty vote of thanks to the lecturer, which was carried unanimously.

THE LECTURER, in reply, said he had taken the precaution of explaining at the beginning of his lecture that he had been looking at the problem originally from the mechanical engineering end. He had not anticipated having the pleasure of Sir Andrew Balfour's remarks, or the statements of the other speakers. He felt that it was a very difficult matter for him, who had been merely building backwards, so to speak, from the engineering to the agricultural side, to attempt to deal with some aspects of the problem which he had had the temerity to have dealt with that night. Obviously, one could not have the expert knowledge in all these processes which one would like to have.

Reference had been made to the incidence of malaria. He thought he was right in saying that it was only within the last 50 years that the northern part of Italy had been more or less freed from malaria. In the early days of the cultivation

of rice there the peasants had suffered enormously from the incidence of malaria; and he presumed that, as in other countries, the reduction in malaria there had been brought about by special attention to the anopheles mosquito.

With regard to the problem of beri-beri, he could only touch on it in a very general way, because that was a highly specialised department of medical science. Obviously, it was only in cases where rice was literally the staple diet that the remarks which he had made held good. A balanced diet did not produce a condition which rendered the subject liable to beri-beri. Where balanced diets were the custom the incidence of beri-beri was very much less marked.

He would like to know what actually was the average rice production in Mr. McDougall's division.

MR. MCDUGALL replied that it was about 950 lb. an acre of husked rice for the province as a whole.

THE LECTURER said that that was very low. The average throughout the United States was about a ton an acre, and the average of wheat production throughout the world was just under one ton per acre.

With regard to Mr. Bolton's remarks, he had definitely made the statement that, from the general food point of view, there was practically no difference in the value of one rice as against another, and then a little later on he had gone on to state that in eating one kind of rice the native suffered from stomach trouble which other kinds of rice did not produce. His intention had been, in pointing out that there was very little food difference, to refer to big Western consumption. As far as native consumption was concerned there was a difference. What that food value difference was he did not know. He would be only too pleased if he could get some information on the subject.

He hoped there were not any important store keepers present, but to purchase highly artificially glazed rice was ridiculous. It was prepared solely for the benefit of the lady shopper. She went into a shop and saw beautiful pearly glazed rice; she naturally thought it was very fine, and was prepared to pay $\frac{1}{2}$ d. or 1d. more for it than for ordinary commercial rice. That glaze was simply put on by adding powdered French chalk and glucose to the finished polished white rice before it was put into sacks. Quite obviously it had no food value whatever. If one contented oneself by purchasing the ordinary article one was purchasing something which had more food value at a lower price than the highly polished and glazed rice.

A vote of thanks to the Chairman concluded the meeting.

NOTES ON BOOKS

PIONEERS OF PUBLIC HEALTH.—THE STORY OF SOME BENEFACTORS OF THE HUMAN RACE. By M. E. M. Walker. Edinburgh: Oliver and Boyd. 12s. 6d.

The creation of civilisation involved the making of cities and the herding of men in closely packed houses. The wider intercourse of men and the diffusion of culture involved also the accumulation of diseases in the centres of civilisation. These two factors transformed the manner of life for human beings and the development of new circumstances, which were charged with new risks of disease, until men had

learned how to circumvent the dangers to sanitation they themselves had created. Such precautions, however, called for insight into the nature of the danger, some understanding of the causes and prevention of disease, and above all men endowed with such knowledge who had the courage and persistence to persuade or compel their fellows to adopt the measures necessary for the salvation of their own lives and of civilisation. Surely the achievements of no group of men are worthier of being recorded than those which made the world safe for civilisation. Mrs. Walker has put all intelligent people in her debt by recalling the men who accomplished this great service and the circumstances under which they fought their struggles for the benefit of humanity. The epic story she has to tell of the twenty-one men who during the last three centuries have taught us how to maintain our life in cities in spite of the growing dangers is made all the more impressive by the directness and simplicity of its telling. Mrs. Walker has solved the problem of selecting her heroes by accepting the list of names carved upon the outside walls of the palatial home of the London School of Hygiene and Tropical Medicine in Gower Street, the erection of which last year the munificence of the Rockefeller Foundation made possible. Although this list, which starts with Dr. Thomas Sydenham (1624-1689) and ends with Sir William Leishman (1865-1926), affords a striking tribute to the large part taken by pioneers of British nationality in the service of public health, it does not neglect the services of men of other nationalities, Germans such as Van Pettenkofer and Koch, Frenchmen such as Pasteur and Laveran, and citizens of the United States such as Gorgas and Biggs, who in their varied ways have earned the right to be put alongside our own Jenner and Chadwick, Lister and Manson.

The history of how scientific discoveries came to be made has a peculiar fascination, but it is perhaps even more interesting to study the reactions of men to new knowledge and the heroic struggles of pioneers not merely to get recognition for their services but also to persuade even enlightened men to accept the boons their genius makes available.

When Jenner had demonstrated by practical experience the value of vaccination as a protection against smallpox, the President of the Royal Society urged him not to submit the report for publication by the Society. Sir Joseph Banks urged Jenner "to be cautious and prudent," impressing upon him the consideration "that he had already gained some credit by his communications to the Royal Society, and ought not to risk his reputation by presenting to that learned body anything that appeared so much at variance with established knowledge, and withal so incredible."

Mrs. Walker's book is the record of the works of men who were not afraid to risk their reputations even if their pioneer efforts led to results that were flagrantly at variance with established knowledge. The lessons taught by such histories are as badly needed to-day as they ever were in the past. The telling of them is full of human interest and should make the reader more tolerant of discoveries that seem to clash with tradition and hence seem incredible.

G. ELLIOT SMITH.

VICTORIA AND ALBERT MUSEUM. Review of the Principal Acquisitions during the Year 1929. 2s. 6d.

The frontispiece of this interesting review shows the early 17th century panelled room from Haynes Grange, one of the principal acquisitions of the last year, and "perhaps the most impressive of all the rooms of various periods now set up in the Museum." Mr. Maclagan in his prefatory note also selects for special mention an eighteenth century staircase from Glastonbury, a French Romanesque stone angel, the Whitcombe-Greene and Stephenson Bequests (mother-of-pearl carvings and miniatures respectively) and some three hundred designs for armour by Filippo Ursoni.

There are nearly twenty illustrations to the chapter in which acquisitions to the Department of Ceramics are dealt with. Of examples of Near Eastern pottery, perhaps the finest, according to the reviewers, are the two Persian bowls shown on Plate X. Four pieces of the Sung period, from the collection of the late H. B. Harris, are among the series of nineteen Chinese pieces selected for the Museum according to the terms of a bequest "conceived in an unusually considerate and far-seeing spirit."

The first place among acquisitions by the Department of Textiles is occupied by a collection of embroideries and woven fabrics of all times and countries, bequeathed by Mrs. Lewis F. Day. Mrs. Day and her husband (whose book *Nature and Ornament* has just been re-issued by Messrs. Batsford, with a chapter by Mary Hogarth) during their lives worked hard in the cause of good taste, and now part of their legacy will be transferred to the Department of Circulation and "serve as an active memorial" to them.

A number of notable English embroideries have been acquired, including the 17th century set of bed curtains worked by Abigail Pett. (Plate XXXIX.)

There is no space here to describe the Review in any detail, but one may be allowed to add that, doubtless, among the most amusing acquisitions of 1929 is Richard Dighton's "Mirror of Fashion"; fifty-four caricatures by one of the most genial of English etchers. The series is contained in a wooden cylinder with a movable top that serves to rewind the roll when it has been drawn out. This is itself a curiosity, and "is to be welcomed even apart from the interest of the caricatures themselves."

ABSTRACT DESIGN. By Amor Fenn. London: B. T. Batsford, Ltd. 12s. 6d.

Mr. Fenn's book is described as a "practical manual on the making of patterns for the use of students, teachers, designers and craftsmen." It could be usefully read in conjunction with A. H. Christie's *Traditional Methods of Pattern Designing* (Oxford Press). For Mr. Fenn shows us the works, so to speak; he gives geometrical analyses of the most familiar systems of design, with indications of how the figures can be planned. The book is prosaic, as it should be, but not without poetical aspects for those who care at all for the subject.

It is true that "invention is involved in design to a certain extent, but rather in adapting and arranging than in evolving anything that is entirely new." All the more reason for congratulating ourselves when designers rise up with a talent for inventing new combinations of old motives: we have a few in England to-day, in various departments of Applied Art—men and women with almost more originality than the foregoing sentence would suggest is possible—and it should be our concern to see that their ideas are diffused.

Mr. Fenn has a good deal of historical information for his readers, together with examples. His book is produced by Messrs. Batsford with their usual efficiency.

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No. 4053

FRIDAY, JULY 25th, 1930

VOL. LXXVIII

All Communications for the Society should be addressed to the Secretary, John Street, Adelphi, W.C.2.

NOTICES

COUNCIL

A meeting of the Council was held on July 14th. Present :—Mr. Llewelyn B. Atkinson, M.I.E.E. (in the Chair) ; Sir Charles H. Armstrong ; Lord Askwith, K.C.B., K.C., D.L. ; Sir Charles S. Bayley, G.C.I.E., K.C.S.I. ; Mr. Alfred C. Bossom, F.R.I.B.A. ; Professor Sir H. C. H. Carpenter, F.R.S. ; Sir Atul C. Chatterjee, K.C.I.E. ; Captain Sir Arthur Clarke, K.B.E. ; Sir Reginald A. Mant, K.C.I.E., C.S.I. ; Col. Sir Henry McMahon, G.C.M.G., G.C.V.O. ; Mr. John A. Milne, C.B.E. ; Col. Sir Frederick Nathan, K.B.E. ; Col. The Master of Sempill ; Sir George Sutton, Bt., and Mr. Carmichael Thomas, with Mr. G. K. Menzies, M.A. (Secretary), and Mr. W. Perry, B.A. (Assistant Secretary).

Sir Edward Gait, K.C.S.I., C.I.E., was elected Chairman of the Council for 1930-31.

The following candidates were duly elected Fellows of the Society :—

Apperley, D. C., St. Helens, Isle of Wight.

Artless, George Leslie, Derby.

Bagdatopoulos, William Spenser, Hampton Wick, Middlesex.

Baker, Frederick A., Maplewood, New Jersey, U.S.A.

Briggs, William George, London.

Burgess, George Alfred Edward, London.

Carlton, Major Guy William, Buffalo, New York, U.S.A.

Carr, Paul R., Long Island City, New York, U.S.A.

Champion, Reginald George Charles, Kenton, Middlesex.

Coghill, Robert Douglas, Roslyn, Dunedin, New Zealand.

Doherty, Joseph Francis, Dublin.

Ellis, Bertram Wyburrie, A.M.Inst.C.E., Cookham Dean, Berkshire.

Esdaile, Mrs. K. A., London.

Fevyer, George William Henry, London.

Follick, Dr. Mont, London.

Gauger, Professor Alfred William, A.M., Ph.D., University of North Dakota, U.S.A.

Kennard, Mrs. H. A., London.

Lawson, David, New York City, U.S.A.

Leaver, Edmund Spriggs, Reno, Nevada, U.S.A.

McDonald, Miss M. M., London.

Mears, Professor Eliot G., Stanford University, California, U.S.A.

Mehta, Kalyandas Jivandas, Bombay, India.

Patrick, Mrs. Gertrude, London.

Rex, Captain Edwin Stanley, West Wycombe, Bucks.

Rose, John Joseph Burnside, Ulverston, Lancashire.

Slater, Reginald John Langham, London.

Terry, William Joseph, London.

Turberville, Rev. A. C., Stansted, Essex.

Zapf, Oscar, Reno, Nevada, U.S.A.

Various Committees were re-appointed for 1930-31.

A number of valuable prizes offered for designs in Beati Ware were provisionally accepted, and it is intended to hold a special section of the competition of Industrial Designs in the autumn. Particulars will be ready shortly.

The arrangements for the forthcoming session were considered.

A quantity of financial and formal business was transacted.

The thanks of the Council were accorded to Mr. James H. Hyde for a further donation of £500 to the Fund for the Preservation of Ancient Cottages. This is the fifth contribution of the same amount that has been received from Mr. Hyde, and the Council desire to place on record their gratitude for his generous support of the movement.

COMPETITION OF INDUSTRIAL DESIGNS

A selection of the Designs received in the above Competition for Prizes and Scholarships offered by the Society and well-known manufacturers will be exhibited, by kind permission of the Board of Governors, in the Exhibition Pavilion of the Imperial Institute, South Kensington, from the 2nd of August to the 31st August, both inclusive, every weekday from 10 a.m. to 5 p.m., and on Sundays from 2.30 to 6 p.m.

The Exhibition is open free of charge ; no tickets are required. It will include Designs for Architectural Decoration, Textiles, Furniture, Printing and Book Production, Pottery and Glass, and for Posters, Showcards, etc.

Several important firms have expressed a wish to offer Prizes for Designs in connexion with the 1931 Competition.

A Bureau of Information has been established at the Royal Society of Arts in connexion with the Competition, for the registration of the names and addresses of exhibitors who desire to obtain employment as designers. These lists are at the service of manufacturers in search of designers.

A report on the competition, including full lists of awards, will be issued at a later date.

THOMAS GRAY MEMORIAL PRIZE

Under the Thomas Gray Memorial Trust a prize of £30 for Navigation is offered annually for competition among the students of the H.M.S. Conway School Ship, the H.M.S. Worcester Training Ship, and the Nautical College, Pangbourne. On the recommendation of the examiner the prize for 1930 has been divided between the two following candidates, who gained an equal number of marks :—

Frank Murray Bardsley, H.M.S. Conway School Ship.

Richard Mann Southon, The Nautical College, Pangbourne.

PROCEEDINGS OF THE SOCIETY.

THOMAS GRAY LECTURES

AIDS TO NAVIGATION

By COMMANDER F. G. COOPER, R.D., R.N.R.

LECTURE I.—*Delivered March 24th, 1930*

It is my privilege to appear before you this evening at the invitation of this learned Society, to talk to you about Aids to Navigation ; they are many and varied, like the spots on a rocking horse, so I will preface my remarks by stating that by aids to navigation I mean those various appliances, old and new, by means of which we navigate a ship from port to port. I am not concerned with such appliances as stream line rudders, bulbous stems, stability indicators and other devices with which many modern ships are fitted, although it has been suggested to me that they are aids to navigation ; if so, then I should have to include the engines, propellers, anchors and other parts of a ship, and even the hull of the ship itself !

The Mariner's Compass.—Having made myself clear as to the definition of aids to navigation, I will take as my first subject that prime aid to all navigation, the mariner's compass, for without it we should be unable to navigate the seas that encompass this globe. I will trace briefly its evolution from a primitive form to the highly refined forms it takes at the present time, in the gyroscopic compass and the Holmes magnetic compass, with its adaptation of the principle of repeaters to various parts of the ship.

Contrary to our generally accepted belief, I find that the mariner's compass did not originate in China, thereby shattering another cherished illusion ! The discovery that a lodestone, or a piece of iron that had been brought into contact with that stone, will direct itself to point in a North and South direction, and the application of that discovery to the navigation of ships, has been variously attributed

to the Chinese, Arabs, Greeks, Finns, Etruscans and Italians, but investigators of the subject have been unable to reach finality. There is no record of a compass in China prior to A.D. 1297, and it is worthy of remark that the Chinese reckoned from the South seeking end of the needle, not the North ; in this matter, as in many others, that remarkable race acted in a manner contrary to all other races, and to-day one sees in Chinese ports the carpenters planing towards themselves, the builders placing the roof on a house before constructing the walls, the people generally adopting white instead of black as a sign of mourning, and from my own observations I have noticed that their dogs are loose but their cats are chained up and live in kennels ! All of which is in accord with the teachings of one of their renowned philosophers, Chuang Tzu, who flourished some three centuries before the Christian era, and who spent his life endeavouring to establish the identity of contraries, and in pointing out the utter uselessness of all useful things.

After this slight digression into the realms of Chinese philosophy, I will continue to discuss the mariner's compass. The earliest authentic form of the compass needle for directing the course of a ship is mentioned by an Arabian writer in 1282 A.D., who states that he observed, while on a voyage from Tripoli to Alexandria in 1242, that the mariners used a magnetized needle, floated on water by means of a splinter of wood, to direct them on their course. From that primitive form of compass to the elaborate instruments of to-day, is a considerable step, and interesting as the study of the evolution of the compass may be, the time at my disposal is too brief to permit more than this passing reference.

The usual form of compass up to the year 1876 was a long, flat magnetised needle fixed beneath the card, the whole suspended edgeways and pivoted on a hardened point : the method of compensation of this form of compass was, compared to that of its successor, primitive, and left much to be desired in iron ships. In 1876 Sir William Thomson, afterwards Lord Kelvin, introduced an improved form of mariner's compass, a form known to all those seamen who are present this evening. It is unnecessary for me to describe in detail the Kelvin Compass, beyond remarking that the prime improvement was the substitution of a number—eight—of short needles for the one long one in general use up to that time. These needles are suspended by silk threads from the outer ring, and the card is balanced on a pivot stem made of brass and tipped with iridium, the aluminium cap which fits this pivot having a sapphire centre. Improved methods of compensation were introduced, notably the quadrantal error due to transverse iron could be corrected for all latitudes.

Since its introduction there have been modifications and improvements in the Kelvin compass, two of the more important being the lighting from underneath and the introduction of a liquid form of the compass, which form is being more widely used in the Merchant Navy to-day owing to its greater steadiness. The latest form of magnetic compass is that known as the Holmes Compass : in this form the directive force of the needles is amplified electrically, and by a suitable arrangement of wiring, the readings of the Master Compass are recorded on

repeaters placed in different parts of the ship in a similar manner to that of the gyro compass. The admirers of this form of magnetic compass predict that it will supersede the gyro, which they consider to be of too mechanical a nature for reliability ; on that point I offer no opinion, therefore I shall not be acclaimed a partisan !

I now come to that remarkable instrument known as the gyroscopic compass, an instrument entirely independent of the earth's magnetism. Its opponents state that, as it is a purely mechanical instrument and dependent upon electric power for its functioning, it can, therefore, never supersede the magnetic compass, which must always be held in reserve. It may be permissible to remind you that there were similar Die-Hards when iron ships were first constructed, their arguments against the use of that metal being that iron sinks and therefore was not suitable for shipbuilding ! To my mind, all such arguments are reactionary, and carried to their logical conclusion, would compel the retention of masts and yards in modern steamships, to be held in reserve should the main motive power, steam or internal combustion engines, fail. I ask you to imagine a modern steamship of say 30,000 tons, with engines totally disabled, or all propellers lost, staggering into the nearest port under canvas ! An inspiring sight for the supporters of sail training ! Such contingencies are possible but highly improbable, and although men and machines are fallible, it is quite sound seamanship to accept such risks.

The gyroscopic compass depends for its directional force on the rotation of the earth, the gyro in its simple form being a wheel so mounted that it has three degrees of freedom, i.e., freedom to rotate about its own axis, freedom to rotate about a horizontal axis, and freedom to rotate about a vertical axis. These are termed the three degrees of freedom, and when the wheel is spinning with sufficient momentum, its axis will preserve its direction in space irrespective of any movement of the stand in which it is contained : this property is termed rigidity in space, and it is the application of that property, with certain mechanical compensations, which has resulted in the gyroscopic compass as an instrument of direction. The late Lord Kelvin was the first to demonstrate that the gyroscope could be used as a North seeking instrument, although he did not pursue his investigations : this was in 1883. In 1852 Leon Foucault experimented with a gyroscope in conjunction with a pendulum, to determine the exact rotation of the earth, and he it was who gave the name gyro-compass to the instrument, but it was not until the end of the nineteenth century that the utility of the gyroscope could be fully realised, and this was due to the introduction of the electrically driven rotor.

The first gyroscopic compass was made by a German scientist, Dr. Anschütz, of Kiel, in the year 1910. This was followed during the succeeding year by the American type of gyro invented by Dr. Elmer Sperry, and in 1916 the first British gyro compass was introduced, the joint product of the late Professor John Perry and Mr. S. G. Brown, both Fellows of the Royal Society. All these instruments were similar in principle but differed in details of construction and adjustment.

In the early stages of the gyro compass there were considerable difficulties experienced with errors which arose when steering on intercardinal points, otherwise quadrantal courses, due to rolling ; this trouble was overcome in the Anschütz compass by the introduction of additional gyros, and in the Sperry and Brown instruments by what is called the Mercury Ballistic, an ingenious device invented by Mr. S. G. Brown, F.R.S. for overcoming the troublesome quadrantal error. The one other error requiring correction was that called the North steaming error : in amount it was small, but it has been overcome now, and in the Sperry compass its correction is automatic.

It may be accepted that the gyroscopic compass, with its accessories the Course Recorder and the automatic steering device, known vulgarly as Metal Mike, have been thoroughly tried and found worthy as prime aids to safe and accurate navigation, and the gyro compass may be defined as a complicated instrument with few errors, and those errors small and able to be dealt with mathematically, while the magnetic compass is a simple instrument complicated with many errors difficult to deal with successfully.

For those who desire to study the gyro in its relation to the mariner's compass, the work of Mr. T. W. Chalmers, entitled " The Gyroscopic Compass " published by Constable & Co., is worthy of their attention.

The Marine Chronometer.—O. Henry remarked in one of his stories, that the clock measures our follies and limits our pleasures, which is a statement of fact, but my task this evening is to discuss another aspect of the clock, and that is in the form of a marine chronometer, an indispensable adjunct to accurate navigation. As most of you know, a chronometer is a superior clock, designed and made with meticulous care by skilled craftsmen, and it is used in navigation for the determination of longitude East or West of a prime meridian ; the prime meridian accepted by most nations as a standard, is that of Greenwich. It has possibly occurred to some of you that no useful purpose is served by measuring longitude on the earth in two directions, that is, East and West, or in other words, dividing the globe in half ; that has also occurred to me, and it would certainly simplify some problems of navigation and geography, if we reckoned longitude in one direction only, either all East or all West from a Prime meridian, through 360 degrees. In a similar manner it would tend to simplicity if the dial of a marine chronometer were engraved from 0 to 24 hours ; I have, in my time at sea, only seen one such chronometer, and that was the property of the captain of one of His Majesty's ships in which I was serving. It bore the name of a well-known New York firm of opticians, therefore I assumed it to be of American make ; I have recently discovered that the instrument in question was of British make, by the celebrated chronometer makers, Messrs. T. & J. Mercer, of St. Alban's, whose works I recently visited by the courtesy of one of the members of the firm ; I shall have occasion to mention that firm again before concluding my remarks on the chronometer. In passing, I may remind you that astronomers reckon the Right Ascension of celestial bodies in one direction only—Eastwards from the First Point of Aries, which may be

considered as the Prime Meridian of the celestial sphere, in the same way that Right Ascension may be considered as celestial longitude, so why differentiate with the globe which we inhabit ?

The history of the chronometer is interesting, and deserves more attention than it receives from most seamen. Prior to its introduction about the middle of the 18th century, the method in general use for calculating the longitude was that known as the lunar problem ; it was a tedious exercise in the practise of spherical trigonometry, and whatever its merits, the problem required time, more time than the average seaman cares to devote to calculations, and although scientific navigators like Toynbee, Methuen and Lecky practised it well into the nineteenth century, I feel justified in assuming that they did so for the sake of " keeping their hands in," for I have not read that those men distrusted the chronometer.

In the year 1713 the Government offered prizes of £10,000, £15,000 and £20,000 for a timepiece which would be accurate enough to determine longitude within 60, 40 and 30 miles respectively, one of the conditions stipulated being a voyage to the West Indies and back to England. The Yorkshire carpenter, John Harrison, constructed four timepieces, and eventually received the full award for number four of the series, which was in the form of a large watch and fulfilled the required conditions : it is preserved in Greenwich Observatory. The number two of Harrison's chronometers is a large and cumbersome machine, having more the appearance of an early pattern Thompson Sounding Machine than what we recognise to-day as a chronometer ; it is preserved in the Science Museum at South Kensington, and thanks to the knowledge, perseverance and zeal of an officer of the Royal Navy, Commander R. T. Gould, who took it to pieces and cleaned it in 1923, a labour of love for which he deserves much credit, the clock is now ticking ponderously after a silence of 150 years, and is adjusted to a daily rate of about two seconds. I have to thank the Director of the Science Museum for lending me the slide of that chronometer which you will now see on the screen.

Close to this instrument in the Museum may be seen one of the latest products of the chronometer maker's craft : it bears the name of Paul Dittisheim, of Geneva, and has at least one unique feature in the form of a long centre seconds hand which would make observation easy. There are other chronometers in the Museum, of various dates and forms, all worthy of attention.

Harrison received his reward about 1760 : he was followed by Thomas Earnshaw, whose chronometer escapement, except for small details, has stood the test of time, like Scotch whisky, and remains to this day the ideal escapement for long and exacting service. We live in an age of progress, and the latest achievement of the chronometer maker's art, is the production of a self winding instrument, thereby doing away with the time honoured custom of the navigating officer reporting each morning at 8 o'clock, that the chronometers are wound ! This result is achieved by the application of electricity. I may add that this type of chronometer is not yet placed on the market, but I have been privileged to see the

completed instrument. Another improvement is the use of the chronometer to control all the clocks in a ship : again electricity has been used for this purpose, and the instruments on this panel illustrate the method of control. The chronometer is in no way affected by the fitting of this contact, and may be used in the ordinary manner for navigational purposes. The first set of these chronometer controlled clocks to be fitted in a ship was in the new 17,000 ton motor vessel " Rangitiki " of the New Zealand Shipping Company ; on the maiden voyage of that ship last year, the whole outfit was a complete success, the Master chronometer being also used as the navigating chronometer, and in a voyage of four months, the instrument never varied more than 0.8 of a second a day, a remarkable performance.

Chronometers should be handled with care and intelligence, and stowed in a special receptacle in the ship which is free from sudden changes of temperature : a maximum and minimum thermometer should be fitted inside this receptacle and their readings recorded with regularity, for it is upon temperature that the daily rate mainly depends. The test of a marine chronometer at Kew occupies 55 days, and the temperatures to which it is subjected vary from 45 to 90 degrees Fahrenheit : upon this test depends the granting of a certificate. In the works to which I have already alluded, chronometers are subject to much more severe temperature tests, the range there varying from Zero to 100 degrees Fahrenheit.

With the increasing use of wireless, the chronometer is liable to fall into disrepute, but I venture to think that, to the careful navigator, the chronometer will always be regarded as an indispensable aid to safe and accurate navigation.

The Pelorus.—This instrument, the invention of Lieutenant Friend, R.N., deserves mention as an aid to navigation, for although it has been superseded in ships fitted with gyro compasses and repeaters, it is still used in the majority of merchant ships. The instrument consists of a metal plate engraved as a compass card, and it is mounted either on a pedestal or in a portable box, in a similar manner to a compass, that is, with gimbals, and it also has sight vanes for taking observations. The disc or dumb card, is so fitted that it is free to revolve in a horizontal plane, and it can be secured as required by a large milled-headed screw. The purpose of the instrument is that of taking bearings of points of land, or azimuths of celestial bodies when adjusting the compass ; it is essential that the lubber line of the instrument should coincide with the fore and aft line of the ship, otherwise bearings would be useless. The instrument is made in a variety of designs, from the simple form contained in a box which may be carried from one position to another, to the elaborate type fitted to a brass standard in a permanent position in the ship ; all designs serve the same purpose. The term Bearing Plate is a naval term for what is generally termed a Pelorus in the Merchant Service, and may be accepted as the same thing.

Parallel Rulers.—I think it will be conceded that these apparently insignificant appliances merit the designation of an aid to navigation, although it would be possible to make shift without them : I understand that it was the custom in

ships hailing out of Aberdeen in former years, to use a protractor and a straight edge made by the ship's carpenter, thereby effecting a considerable saving—in shillings, but I speak subject to correction, for this yarn is probably another aspersion on the generous instincts of the inhabitants of a city renowned for its hospitality !

The parallel ruler in its simple form, consists, as you know, of two pieces of box wood or ebony connected by brass joints, and capable of being transferred in a parallel direction across the surface of a chart : most of us who went to sea thirty or forty years ago found this type in general use, but even the humble parallel ruler has undergone refining influences, due to an advancing civilisation, the first of which was introduced by Captain Field, and took the form of a ruler with graduated edges, thereby enabling courses and bearings to be laid down independently of the compass engraved on the chart. Then came a further improvement, which was an arrangement of the brass or white metal connecting joints being so constructed that the ruler could be advanced in a direct manner without deviating to the right or left ; later we had parallel rulers of both types made of metal, later of celluloid or horn. Another improved form of parallel ruler, made of either metal, wood or celluloid, is the rolling ruler, favoured by many navigators, and execrated by many others. The latest improvement to the parallel ruler is that of Mr. Richard Power, which has only just been placed on the market ; I have one of the rulers here, and its value will be appreciated more by an inspection than by any words of mine.

Protractors.—We now come to protractors, and they may be obtained in many forms but their purpose is the same, i.e., for protracting or plotting angles on the chart or other flat surface. They take the form of a semi-circle, the circumference of which is accurately divided in degrees with the centre clearly marked ; they are made of horn or celluloid, or other transparent unbreakable substance, but those made of metal are to be preferred for the same reason that metal parallel rulers are the best—they are not affected by changes of temperature, and consequently will not warp. There are two forms of protractor, specimens of which I have with me, not so widely known as they deserve to be ; one is known as the Douglas protractor, and is made from the design of Admiral H. P. Douglas, the present Hydrographer of the Navy. It combines the functions of both protractor and parallel ruler and is a unique instrument, and simple to use. The other form of protractor is that known as the Lenthall : it serves the purpose of an ordinary protractor, and in addition it may be used for :

1. Finding the centre of a circle.
2. Dividing a straight line into any number of equal parts.
3. Drawing a line at any desired angle to a given line.
4. Drawing parallel lines.

These are a few of its many uses, and I think that its utility merits inclusion as one of the minor aids to the art of navigation. I may also mention that its price is about the same as that of an ordinary protractor.

Dividers.—With parallel rulers and protractors we generally associate dividers, those humble but nevertheless most necessary aids to navigation; they do not inspire one to eloquence in discussing their merits, but it may be stated that of all the instruments used in practising the craft of navigation, they have undergone the least modification of form. They were originally made of hard wood and jointed or hinged with metal: they are nowadays made of metal of various sorts with hardened steel points, and it is hardly necessary to point out that they should be accurately jointed and capable of adjustment at the joint. With the more delicately constructed dividers which are used in the drawing office we are not concerned, their use being outside the scope of navigation, but those known as proportional dividers are not without their use in practising the art of navigation although not strictly necessary.

The Station Pointer.—I must include in my subject that instrument known as the Station Pointer, although it is little used outside ships of the Royal Navy, Surveying vessels and Cable ships. It is an instrument used for plotting on the chart the angles of headlands and landmarks measured with a sextant, and so fixing the position of the ship at the time the angles were measured. It consists of a graduated circle having attached to it three arms, two movable and one fixed; in the standard instruments used in surveying the two movable arms are fitted with verniers for reading angles to minutes, and the arms are also fitted with extension pieces. In the instruments in use in merchant ships, the circle is of celluloid or other transparent substance, the arms are without vernier attachments or extensions, and when used, the nearest degree is sufficiently accurate for ordinary purposes of navigation. For those interested in mathematics, it may be stated that the principle on which the station pointer is founded is to be found in the 21st Proposition of the third book of Euclid, which states that: "The angles in the same segment of a circle are equal to one another."

The Range Finder.—I will now pass on to another valuable, but little used aid to navigation—the Range Finder. Again, this instrument is rarely to be seen in Merchant ships, although its value to the navigator is inestimable in fixing his distances from objects, either stationary or moving. It is not my purpose to discuss the optical principles on which the range finder is founded: that is the subject of specialists, but as an aid to navigation the accuracy of its principle may be taken for granted. The Admiralty Manual of Navigation recommends the range finder as "by far the quickest and most accurate method of obtaining distance."

There are two types suitable for use in merchant ships, the larger one having a 4ft. 6in. base length, with magnification of 28 diameters and graduated from $2\frac{1}{2}$ cables to 125 cables, and the approximate uncertainty of observation with this instrument is one cable at six sea miles distance. The smaller instrument has a base length of $31\frac{1}{2}$ inches and magnification of 14 diameters, and its scale is graduated from $1\frac{1}{2}$ cables to 100 cables. The approximate error on this type of range finder is one cable at three sea miles. This form of the instrument is made with either a tripod mounting or a fitting for attachment to the rail, and it is a.

interest to remark that instruments of this pattern are fitted in many trawlers, as it is extremely useful to them in maintaining with accuracy their position outside the three mile territorial limit. I speak subject to correction, but I imagine that the Range Finder must be in demand on board those vessels which, pursuing their unlawful occasions, are occupied in transporting across the seas, alcoholic beverages for the refreshment of those citizens of the United States who have not yet been converted to a belief in prohibition, and as the limit of territorial waters has been extended to twelve sea miles, Range Finders of the larger type will be required in order to keep beyond the waters of the coast that are infested with "rum hounds" eager for prey. All of which is to the advantage of Messrs. Barr & Stroud, the well known makers of Range Finders.

The Sextant.—Without this instrument in one of its many grades, the navigator cannot be considered as complete, although Samuel Butler, in "*Hudibras*," omits to inform us whether his complete navigator was equipped with one. Some of you will perhaps remember that satirist's description of that paragon of exactitude :

"For he by geometric scale, could take the size of pots of ale,

"Resolve, by sines and tangents straight, if bread or butter wanted weight."

I think that I may take it for granted that most present day navigators are quite competent to take the size of pots of ale without the assistance of geometric scales !

The earliest form of instrument for measuring altitudes of celestial bodies is known as an astrolabe : it is believed to have been invented by the Greeks some two centuries B.C., and it may be claimed as the oldest scientific instrument in the world. It consists of a large metal ring varying in diameter, the limb, or part of it being divided into degrees and minutes of arc. It is fitted with a movable index pivoted at the centre and having two sights, and by its aid it was possible to obtain a rough altitude of a celestial body whose declination, being known, gave the early navigator his latitude. It was a primitive instrument, but it survived through many ages and served generations of seamen, right up to the 18th century, when it was supplanted by Hadley's Quadrant. The instrument we are going to see on the screen is dated 1470 A.D. and is a Persian instrument, as may be seen by the figures on the periphery and elsewhere. The idea of dividing the periphery of the astrolabe into angular divisions was an Arabian invention. The astrolabe was succeeded by the Cross-Staff, another primitive instrument, and it is not until 1731 that a real improvement was made in these instruments when Hadley introduced his quadrant. The instrument was originally made of wood, and with a radius of 20 to 24 inches, this long radius enabling the observer to read as fine an angle as possible, as originally these instruments were without a vernier, that improvement not being fitted to quadrants until some years later, although it had been invented by Pierre Vernier as early as 1630. Hadley's quadrant was the immediate predecessor of the modern sextant, and to him all praise is due for his instrument which revolutionised the methods of observing altitudes of celestial

bodies, but at the same time one is compelled to an expression of admiration for the amount of skilled navigation which was accomplished by means of the astrolabe and cross-staff, the instruments used by Colombus and other illustrious navigators. For the information of those who are interested, I should like to mention that there is to be seen in the Science Museum at South Kensington, an astrolabe which is a relic of the Spanish Armada.

From the quadrant of Hadley to the modern sextant is a far cry, but the principle remains the same : there have been modifications and adaptations of that principle, due to our wider knowledge of mechanics and optics. The modern sextant, quintant or octant, has a metal frame, the arc and vernier being of silver, but for those nautical sybarites endowed with æsthetic tastes and long purses, there are sextants with gold arcs and platinum verniers ; they are beautiful examples of the instrument makers craft, but are not for the ordinary poor sea officer. In my time at sea I have only been shipmates with one such instrument de luxe, and it was the property of a fellow apprentice, won as a prize in the training ship " Worcester." He was a worthy youth of much promise, but he developed an early taste for beer, and in San Francisco he sold this beautiful prize instrument, not for a mess of pottage like Esau, but for American dollars which he speedily converted into beer, and at this distance of time, I will cheerfully admit that I assisted him to squander the fruits of that transaction.

But I am wandering from my subject, so will continue my remarks about sextants. A few years ago there was a considerable improvement in the mechanics of the sextant, which took the form of an endless tangent screw and clamp ; with this patent it is impossible to come to a dead end of the tangent screw at a critical moment, so annoying to many of us in days gone by. A further improvement which has been recently introduced in this country, although I understand that it was in use in Germany more than twenty years ago, is the micrometer tangent screw, which replaces the vernier and its microscope as we know it ; it certainly simplifies sextant reading, but like many other innovations, it has its opponents, chiefly among those with failing eyesight ! Coincident with these improvements to the sextant, there have been developments in the accessories, particularly in telescopes and prisms. There are telescopes for all tastes : blank tubes, plain direct image tubes, ordinary inverting telescopes, extra large inverting, prismatic telescopes and binoculars. Speaking from my own experience, I have always given preference to the inverting telescope for all purposes of observation of celestial bodies, in clear weather ; in hazy weather, I have found that it is better to dispense with a telescope and use a plain tube. Other refinements are the Woolaston Prism which has the property of doubling the image of the star observed, one image appearing slightly above the horizon, the other image slightly below it, and in practice the horizon is brought midway between the two images ; it is a great help to accurate observation, especially with a slightly blurred horizon, and it has the additional advantage of halving any errors, small though they be, of observation. There is also the Nicol Prism, by means of which excessive glare on the horizon is reduced, and there

is also a Prism termed a Lenticular, or elongating prism, which has the property of making a star appear as a line of light instead of a point, which again simplifies observation of stars. There are other gadgets fitted to sextants, such as a watch attached to the handle, an extra arc for recording more than one angle, artificial horizons and spirit levels : they all have their purpose, I presume, but for ordinary navigation of either tramp or liner, they may be regarded as unnecessary refinements. To sum up this talk on sextants, it may be permitted to observe that an indifferent instrument in competent hands is of more practical service than an elaborate instrument in the hands of one unequipped with sound knowledge of principles.

There are other aids to navigation which I shall deal with at subsequent lectures, not less important than those already dealt with. My subject is not one that lends itself to originality or eloquence, but I have endeavoured to hold your attention to a subject which can only be described as somewhat dry, and I am grateful for your indulgence. As the subject of my talk is concerned with ships, the work of men and the contrivances of their hands, I should like to read you an apposite quotation which I came across in my reading recently. It is the epigraph to William McFee's *Life of Sir Martin Frobisher*, and is taken from a source which so far I have been unable to trace :

"As concerning ships, it is that which everyone knoweth and can say, they are our weapons, they are our ornaments, they are our strength, they are our pleasures, they are our defense, they are our profit ; the subject by them is made rich, the Kingdom through them, strong ; the Prince in them is mighty ; in a word, by them, in a manner, we live, the Kingdom is, the King reigneth."

CORRESPONDENCE

ANCIENT BRIDGES

I have read the short article "Tynninghame Bridge," and noted the photograph of the bridge accompanying it in the *Journal* of May 9th. I was glad to observe the implied expression of regret that this structure is to be demolished for it seems to me unfortunate that these early bridge structures must, by reason of the demands of present traffic, be placed in the discard. This feeling is not based upon sentimental notions, but rather upon conditions which I venture to believe are more genuine and better founded. However, let us consider briefly the essential primary factors rendering bridge structure changes necessary, before discussing the abstract elements of this important matter.

From an experience of many years in the construction, strengthening, repair and general maintenance of bridges of various types, I have come to recognise five major conditions which may render the reconstruction of highway bridges inevitable. These conditions are :

1. The original design may be faulty or, on the other hand, the quality and execution of the workmanship employed in the construction may be poor and unsuitable.

2. The material used may possess certain physical properties that will unsatisfactorily resist the natural or other disintegrating agencies to which the structure may be exposed in its period of existence. Stone structures may give evidence of decay by surface spalling and general weathering which extends only a short distance into the stone and does not, therefore, seriously affect their strength.

3. Through lack of adequate and proper maintenance the entire structure or certain portions of it may become irreparably damaged.

4. Changed traffic conditions involving not only an intensifying of the traffic service, but also an increase in the gross weights of traffic units and correspondingly increased wheel concentration loads may render a bridge unsatisfactory through its restricted width of roadway or in its service strength or both.

5. The location of the structure ; the inclines of its approaches and the curvature involved in the highway closely adjacent to its ends constitute elements of danger which may become direct causes of serious accidents.

The importance of these major conditions together with any that may pertain to strictly local aspects should not be underestimated when considering the remodelling or the total reconstruction of an existing bridge. Safety of life and of property are now as they ever have been, prime elements of bridge and highway construction and maintenance.

Quite apart from the service conditions above outlined, the bridges of the British Isles—more especially the early stone, brick and metal ones—can quite properly be said to possess intrinsic value to the communities wherein they exist which, unfortunately, cannot be stated in pounds and shillings, although real and true. Individually, we may speak of them as built in this, that or the other period, and describe them as containing within their construction details evidences of these periods. They are, therefore, history itself recorded in a mute intelligible way, but giving with considerable detail a record of human endeavour ; of the progress of national skill and, withal, a record of the creation and extension of highway construction, transportation, intercourse and trade. Wherever possible and practicable these historical records should be retained and preserved.

History has rendered important, from a world wide point of view, very many locations within the Isles and these, we believe, will gain added interest as the methods and means of transportation develop, with the result that these locations will attract an increasing number of travellers, not only from local sources, but also from foreign countries. With an increased interest in historical things coupled with a desire to view the locations wherein nature has spread upon the hillsides and in the valleys its beauty in bounteous portions, there will come, naturally enough, an increasing source of revenue which will, perhaps, prove of greater value to the rural communities than to the larger industrial and commercial centres.

As a result of careful observation, I have gained the opinion that the bridges upon highways appeal more to the æsthetic sense of the travelling public than does any other single portion or detail of their construction. Structures that harmonize and blend with the rural scenery about them ; that are in harmony with their immediate surroundings and that combine mass and contour to secure an order and regularity that pleases and charms are, indeed, worthy of the best efforts of the engineer.

When considered from the standpoint of remodelling to secure the strength and other physical conditions requisite for present and anticipated future traffic conditions, stone bridges probably present fewer problems than do those constructed of metal. A stone arch bridge lacking adequate strength may quite commonly be reinforced by placing a reinforced concrete arch upon the extrados (uppermost side) of the arch and by reinforcing, when considered necessary, the interior sides of the abutments

to insure abutting supports for the arch reinforcement. The parapets must be remodelled to secure a new desired height. When the approach inclines are too abrupt they must be rebuilt to relieve this condition and this in turn will ordinarily involve increases in the height and not infrequently in the lengths of the approach walls. The use of concrete below the new roadway elevation to reinforce the old portions of these walls and to secure adequate bonding with the new portions is usually advantageous. The remodelling of old portions and the construction of new portions should, naturally enough, involve the use of the same stone material (preferably from the original quarry), and quality of workmanship as that contained in the old structure since by the incorporation of these in the new portions it becomes only a matter of time—a few years at most—when the new portions will become weathered and stained to resemble the older portions of the bridge heads and other face surfaces. When a stone bridge must be widened to provide for the unobstructed passage of an increased volume of traffic the work can be done and, in general, the original appearance of the old structure preserved by the removal of the face stones of one or both bridge heads, the stones being marked, when considered necessary, to identify them for replacement in their original locations. By the use of stones of the same kind and dimensions used in the original structure the abutments, piers and arches of the bridge can then be extended to secure the desired roadway width and the bridge head stones reassembled to secure in the final structure the architectural effect and the general appearance of the original structure. In making the extensions of the abutments, piers and arches, it is necessary only to use stones to produce face surfaces, the interior portions being constructed of concrete. In this way the stone face surfaces form, in fact, only a veneer course well bonded into the concrete main body of the new portions of the substructure and superstructure.

In this connection it seems proper to mention the fact that in Herefordshire County several stone bridges have been remodelled with excellent results under the direction of Mr. G. H. Jack, County Surveyor.

The strengthening and widening of metal bridges presents problems rather different from those of the commonly existing stone structures. Cast iron and structural wrought iron and steel arches are usually adapted to strengthening by the addition of present day structural steel arch ribs interspaced between the original arches and so designed that to the casual observer they may either be hidden from view except on close inspection or, if in view to some extent, they will not detract from the general outlines and outward appearance of the original structure. The widening of such structures, in so far as the super structures are concerned, can quite commonly be effected by relocating the original arch ribs usually at closer intervals (to secure greater strength), and at and adjacent to the upstream and downstream sides of the widened structure to obtain, in the widened structure, the outward appearance of the original. New arch ribs of steel having adequate strength for present and anticipated future traffic requirements will be placed within the mid-width of the widened structure and may, if required for strength or for economy of construction, be interspaced between the original ribs. The strengthening and widening of lattice girder bridges usually takes the form of increasing the number of girders. However, it is at times possible to increase the sections of weak members or to replace them with stronger ones. When the roadway portions of metal bridges involve inclines too steep for present day traffic service remodelling may present difficulties which cannot be overcome except perhaps by the expenditure of unjustifiable amounts.

The substructures of bridges having cast iron or wrought iron superstructures are very commonly constructed of stone and when changes are to be made in them the procedure will not be materially different from that described for stone arch bridges.

In the remodelling of bridges the use of concrete in such manner that portions of this material are exposed to view has produced some unfortunate results—results, we trust, not foreseen by those responsible for their creation. In so far as service strength is concerned these adaptations of concrete are probably successes, but when viewed from an æsthetic standpoint, too many lack the feeling that delights and pleases. Speaking in general, a material in its contact—contrast relation with other materials and in its contrasts of proportions and details of application—discovers to the observer its æsthetic fitness for the purpose for which it is used. In this sense of adaptation test of a material it is desirable that it be used in its natural, every day sort of way with proved-by-service treatment of its exposed surfaces rather than that it be "dolled up" to represent or imitate some other material only to show the deception if not immediately, then after the lapse of a period of time, usually not long extended. Sham should have no place in the preservation of structures of antiquity.

It occasionally happens that an existing bridge considered inadaptable to general traffic services because of its strength or other physical conditions, can be permitted to remain in place by constructing a new bridge in close proximity to it or upon a street or location not far distant, thereby keeping intact an interesting relic of, perhaps, historic significance, and incidentally permitting it to remain in service for pedestrian traffic.

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AN ARTIST TALKS ABOUT COLOUR. J. C. Chase. London: Chapman and Hall.
7s. 6d.

The author of this small book is an American painter and art school instructor. We read in the Publisher's Foreword that "his articles on the 'art game' in the *Saturday Evening Post*, and the one entitled 'Why All This Confusion About Color,' have met with an amazingly large and appreciative response from artists, art students, heads of art schools, and craftsmen." I think the work noticed here helps us to understand the reason for this response.

For whereas once upon a time it was the thing to wrap up facts in a great many words, nowadays we often find writers trying, as in the present instance, to offer up their facts without any sauce of style, or, indeed, even of grammar. See on page 1 of Mr. Chase's book: "What is color—and why?" On page 13 we get this: "If a white-painted clothes closet is not light enough to enable *one* to find *his* shoes or his hats easily the closet should be painted a tint of lemon-yellow. . ." My italics.

Yet there is no doubt of this being a useful little text-book. Pages one to forty really are full of information about colour relations, harmonies and contrasts. After that Mr. Chase describes the palettes of "famous painters"; but most of these are, perhaps, better known in America than on this side of the Atlantic.

P.B.

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No. 4054

FRIDAY, AUGUST 1st, 1930

VOL. LXXXVIII

*All Communications for the Society should be addressed to the Secretary, John Street
Adelphi, W.C.2.*

NEWS OF THE WEEK

*The maintenance of the population in direct touch with the soil is essential if the
national life is to be sustained.*

Stanley Baldwin.

*Science, like an uninformed boy, is most definite and dogmatic just where actual
knowledge is least*

Edward Carpenter.

Tynninghame Bridge.—We are glad to be reminded by Mr. I. Lewelyn N. Edwards, Senior Highway Bridge Engineer, of the U.S. Department of Agriculture, Bureau of Public Roads, that, although we were favoured with a photograph of this bridge, and the working drawings of the new bridge, as far back as May 9th, the matter has not been referred to since. Mr. Edwards recites the various reasons why the reconstruction of this and so many other beautiful bridges in Scotland and this country has become in many instances, inevitable. In almost every case, it is not so much that they are structurally defective for the purpose for which they were built, but that the increased traffic makes road widening essential, and a medieval bridge is obviously unequal to the task now imposed upon it. Tynninghame Bridge is a delightful example of a bridge taking naturally the contour of the narrow road, which was adequate in the past. The question, of course, is whether there is any way of diverting the road, as it would be quite impossible to widen this without destroying the charm of the relation of the stone

work to the sweep of the road. Any attempt to keep the bridge and remodel it, as was suggested in Mr. Edwards' letter, with concrete, would hopelessly destroy the beauty of the bridge. The local authorities should consider, if possible, a way of retaining the bridge and getting another road where a suitable modern bridge could be made adequate to the traffic of these days. There surely is no reason why even a concrete bridge of a greater width, shaped to the contours, should not be made beautiful in its own way, but it needs the very greatest skill to produce such a bridge. The examples so far of bridge-widening have not proved successful. They have generally been left to an engineer with no æsthetic training and in consequence no real feeling for the materials used. There is a very interesting article in that attractive little quarterly produced by the British Reinforced Concrete Engineering Co., Ltd., by Mr. Tristan Edwards on "Living Concrete," from which we may quote :—

"The æsthetic quality (in concrete) is not something added to the utilitarian, but must be present in the design from the start. Therefore, instead of the word 'beauty,' which is so often confused with prettiness or ornament, I propose to use another word and say that the special quality which we need in reinforced concrete building, as indeed in all other building, is vitality. I can scarcely imagine that the protagonists of any of the various schools of architectural thought would be willing to come into the open and deny that a building or a work of engineering should have vitality. We do not attain vitality in building merely by the recognition of a utilitarian or structural standard."

One of the worst instances one calls to mind is the widening of old Wareham Bridge. The approach over the Bridge to Wareham was one of the most beautiful things one remembers, and it would have been well worth retention and another approach formed, if the Town of Wareham had realised the value of this old bridge in its attraction to visitors. It has been replaced by a hard concrete structure, entirely out of sympathy with the buildings to which it is an approach. The Society for the Protection of Ancient Buildings is doing a great service in making a survey of all the Ancient Bridges of England, and no doubt they will endeavour to persuade the authorities in Scotland to preserve this interesting specimen and so many others that are in jeopardy in all parts of England.

Advertising.—Mr. A. J. Greenly, who is described as one of the most enterprising of our young modern advertising men, says "In these days I would say to business men that one of the most effective ways of increasing trade is to advertise." Surely no intelligent person would disagree with Mr. Greenly. The only question at issue is as to the best way to advertise and get the permanent attention of the public without any violation of our streets and villages. There seems to be a tendency for firms to proclaim publicly the fact that they do not advertise in an unseemly way. Perhaps this is the reason why Mr. Greenly

thinks it is time to insist that there should be no cessation of advertising anywhere without any consideration of the seemliness thereof. Lord Luke also insists on the absolute necessity for all enterprising firms to advertise at all costs if they are to keep the attention of the public on their products. One of his arguments for insistent advertising is that there is a younger generation growing up that must be made familiar with the particular ware whose quality is unquestionable. We fear the younger generation will look back on the present method of advertising as a very unfortunate episode in business enterprise. Why, for instance, should the country be constantly flooded with enormous advertisements advocating the relative advantages of two particular commodities, just because there is a determination at all costs for two firms to get the ascendancy. The arguments for this kind of advertising, if carried to their logical conclusion, would involve one in maintaining that, in order to catch the eye, the most beautiful situations would obviously be the best places in which to place these advertisements.

How would the owners of these particular goods like a rival firm to place hoardings on their country residences or their offices? If they believe in this sort of advertising, surely this would be the best place to put them. The most important clause in the Rural Amenities Bill, which was defeated, gave definite powers to local authorities to remove all public advertisements.

The local authorities have in fact considerable powers, which they have never used. Shell-Mex, Ltd., have done a considerable service by publicly announcing that they do not advertise in places of beauty, and have illustrated in their advertisements the sort of places where it would be obviously unseemly to exhibit an advertisement in any lurid way. The logic of their decision really applies to a multitude of places frequented by motorists where advertisements can be constantly seen, and it is clear that the public are getting tired of the growing tendency to indiscriminate advertisement, and that there must be a reaction against the firms who continue this practice. The psychological effect will be that the public will subconsciously dislike the wares so advertised, and this particular business will cease. At the moment there is a sudden defiant increase of advertising in all directions; this may perhaps be prompted by the fear that what seems to the modern business man an asset to his business should by the action of firms with greater foresight cease to have any meaning. He would then have to turn his attention to more educated and subtler means of making known the value of his wares. The newspaper is obviously the appropriate and most effective means of advertising, but there are any number of other ways which many firms are adopting, calling attention to the special merits of their goods, with the help of the artist. If the present condition of things were to continue, and if every available space on houses, hoardings, and other possible sites were covered with advertisements, the work of all the Societies for preserving the amenities of England and its buildings would be quite meaningless. Already the man in the street is becoming so used to this chaotic and confused advertising that it is not surprising that he sees little beauty in the simple buildings of the past which Societies ask him to preserve.

PROCEEDINGS OF THE SOCIETY

THOMAS GRAY LECTURES

AIDS TO NAVIGATION

By COMMANDER F. G. COOPER, R.D., R.N.R.

LECTURE II.—*Delivered March 31st, 1930*

In my last lecture I dealt with some of the more important Aids to Navigation, such as the mariner's compass, the chronometer and the sextant. This week I propose to commence my lecture by talking to you about various types of Sounding Machines and different methods of sounding. The time-honoured method of obtaining the depth of water beneath the ship was by means of the deep sea lead attached to about one hundred fathoms of special rope, called lead line ; this line was carefully marked, and for the benefit of those present who are not acquainted with the world of ships and seamen, it will be as well if I mention how the deep sea lead line was marked. The conventional marks are as follows :—

At 2 fathoms a piece of leather having two ends.

3	„	„	„	„	three ends.
5	„	a piece of white calico.			
7	„	a piece of red hunting.			
10	„	leather with a hole in it.			
13	„	a piece of blue cloth.			
15	„	a piece of white calico.			
17	„	a piece of red hunting			
20	„	a piece of cord having two knots in it.			

This is the method of marking the hand lead line ; the deep sea lead line is marked in a similar manner, with the addition of one extra knot in the piece of cord for every ten fathoms, i.e., thirty fathoms three knots, forty fathoms four knots and so on up to a hundred or one hundred and twenty ; to indicate each five fathoms, there is usually a piece of cord with one knot between each division of ten fathoms. This method of sounding was primitive, slow, and uncertain to a few fathoms, and it also had the disadvantage of necessitating the slowing or stopping of the ship. Nevertheless, this ancient method survived until comparatively recent times, and speaking for myself, I had no experience with patent sounding machines of any sort until I left sail and went into steam, and that is not such a very long time ago—say thirty years !

This method of sounding was greatly improved upon by the introduction of Sir William Thomson's patent sounding machine, which permitted soundings to be taken frequently and accurately without stopping the ship, although it is usual to reduce speed in fast ships when sounding. The machine took the form of a

pedestal on which was mounted a revolving drum : on this drum there is coiled a length—some three or four hundred fathoms—of fine wire, either piano wire or stranded wire. The drum can revolve independently of the spindle, or it may be clamped to the spindle by means of a disc ; to this wire is attached the lead, which weighs about 28 lb., and above the lead is the metal case for holding the glass tube, the inside of which is treated with chemicals which change colour when brought into contact with sea water. The lead is armed, that is to say, in the hollow at the bottom of the lead there is pressed either soap or tallow, or a mixture of both : this serves the purpose of bringing to the surface a sample of the bottom of the sea on which it touches, thus indicating, by reference to the chart, the approximate position of the ship. It is unnecessary for me to enter into the mechanical details of working the machine, but when the lead is hove in, the arming is examined and the tube extracted from the metal container. This glass tube is then compared with a graduated boxwood scale from which the depth is read off. The principle on which the tube acts is that of pressure, for being open at one end, the water is forced up into the glass tube as the lead descends, and discolours the chemical ; the amount of discoloration is easily seen, and when placed on the boxwood scale, the depth is read. There is a small correction to apply to the depth so obtained, depending upon atmospheric pressure, but it is small, and may be disregarded in general practice. With the barometer at

29.75	inches	add	one	fathom	in	every	forty.
30.00	„	„	„	„	„	„	thirty.
30.50	„	„	„	„	„	„	twenty.
31.00	„	„	„	„	„	„	fifteen.

There is also an attachment to this sounding machine which replaces the chemical tubes ; it is termed a depth recorder, and works on the principle of pressure against a spring. As the sinker or lead descends, the increased pressure forces a piston up into the tube against the action of the spiral spring, and as the recorder descends, a marker is pushed along the piston. When the recorder is brought up again, the piston comes back to its original position, but the marker remains at the place on the scale to which it was pushed, and the depth is read off the scale. This instrument requires care, and was never so popular as the glass tubes.

Improvements in this type of sounding machine have been made since its introduction, and as it is made by various firms, there are various types on the market, but the principle of Lord Kelvin remains the same. The machine was originally, and for very many years following its introduction, screwed or bolted to the deck at the stern of the ship, but of recent years it is usual to have the machine fitted amidships under the navigating bridge, and by means of a boom rigged out from the ship's side, to which is fitted a carrier for the lead, soundings are taken from that position. The latest type of this pattern sounding machine is motor driven, and it may be mentioned that in both hand and motor driven machines, the amount of wire run out is indicated on a dial fitted to the machine.

Echo Sounding.—We live in a progressive age, so it is not remarkable that man's inventive mind sought to improve upon the method of obtaining soundings from a moving ship by other means than those just mentioned, and after much original research, the principle of echo sounding was arrived at. That principle depends upon the known rate at which sound travels in water. Roughly speaking, the velocity of sound in air is 1,100 feet per second: in sea water of about 35 per cent. salinity, its velocity is just under 5,000 feet per second. These figures are approximate, the temperature of both air and water having an effect on the transmission of sound, but for purposes of echo sounding, it is safe and reasonable to accept a mean temperature of the sea about 59 degrees Fahrenheit, or 15 degrees centigrade.

The apparatus consists of receiving gear, the transmitter and the hydrophone. The receiving gear is placed on the bridge and consists of a large watertight metal case resting on four legs or supports; there is a hinged door fitted with a glass window for reading the fathom scale, and a handle at the side for operating the fathom scale without opening the case. In addition, the headphones are attached to this box or case, inside which is the gear operating the machine. The transmitter is fitted inboard about the turn of the bilge, but its exact position will depend upon the lines of the ship; it is in effect, an electrically operated hammer which, acting upon the plates of the ship, transmits the sound, the echo of which from the bottom of the sea, is picked up by the hydrophone, which is fitted on the opposite side of the ship, and from that hydrophone is conveyed, by electric wires, to the headphones on the bridge. The instrument appears of a complicated nature, and to one like myself, having but an elementary knowledge of mechanics and electricity, it is intricate, but it is perfectly simple to manipulate, and its readings dependable, which is what the mariner mainly requires. The apparatus was designed by the Admiralty and first fitted in ships of the surveying service in 1924. Minor modifications and improvements followed as the result of experience, and in 1925 the manufacture of the instruments by Messrs. Henry Hughes and Son, the well known nautical instrument makers, was commenced under licence from the Admiralty. The first vessel in the Merchant Service to be fitted was the M.V. Asturias of the R.M.S.P.Co.: this was in 1925. Some trouble was experienced with this installation, due to the hydrophone being screened from echoes by air pockets, due to the skin of the ship being covered with air bubbles below the water line. This led to investigation of the trouble, which was remedied, and since that installation there have been no false echoes and no interference by air in ships fitted with the Admiralty pattern gear. The average sailorman is inherently conservative, and opposes all new fangled notions and gadgets, and on matters of this sort shipowners are only too ready to accept his advice, for it restricts expense on such superfluities as aids to navigation, and permits more money to be spent on Roman swimming baths and Renaissance lounges; hence the limited number of our ships fitted with this invaluable aid to safe navigation. The advantages of the echo system of sounding are obvious; by moving a switch

to start the transmitter and other mechanism, and listening for a few moments in the headphones, the navigator will hear the echo and be able to read off in front of him the depth of water under his ship at the moment. There is no reduction of speed necessary, no machine to rig and unrig, and no leadsmen required: further, the depth recorded is before the eyes of the officer of the watch at any given moment, which, together with the patent log recorder in the chart room, inspires confidence in navigating in fog.

At the present time there are types of this machine made for both shallow water sounding and oceanic sounding; the latter type is for use in surveying ships and cable laying vessels. In 1926 the cable ship *Dominia* obtained soundings with the Echo Machine in well over 3,000 fathoms. All vessels of the Royal Navy, from H.M.S. *Nelson* to a sloop, are fitted with the apparatus, and it is interesting to read the remarks of the navigating officer of H.M.A.S. *Australia*, apropos navigating that ship off the coast of Nova Scotia in fog. He remarked: "I kept the wire sounding machine going as if I had no Echo, and the comparison between the two is like a Rolls Royce to a second-hand Ford."

The present Hydrographer of the Navy, Rear-Admiral H. P. Douglas, has expressed himself as having nothing but praise for the instrument, and remarked in the course of a speech, "I am of opinion that every well-found ship should, and in the course of time will, be fitted with this new method. Then the captain, with his Wireless Directional apparatus, assisted by the Echo Sounding Gear, will be a far happier man when navigating in thick weather and approaching land."

The commanding officers of several of the well-known liners, both of this country and others, express unqualified appreciation of echo sounding, and it is interesting to state that it is being used with satisfactory results in trawlers, where accurate depth is important when using the trawl.

In the course of a lecture of this sort it would be invidious to single out any particular make of apparatus for mention, and it is only just to state that there are other types of Echo Sounding Machines, one with which I am acquainted being the production of the Submarine Signal Corporation, termed the fathometer. The principle upon which this instrument functions is that of the transmission of sound in water and the echo of that sound. The sound is produced by an electrically driven transmitter fitted on the bottom of the ship in a suitable position having regard to the co-efficient of fineness of the particular ship, and the reflection of that sound, in other words the echo from the sea bed. This echo is received through the medium of a hydrophone, also fitted to the ship's bottom, and it is automatically translated into a visual indication of the depth of water at the instant of its reception. The observer switches on and looks at the dial in the chart room or on the bridge, as the case may be: the depth is instantly recorded on the dial by a flash of red light that appears opposite to a numeral corresponding to the actual depth at the time. As long as the apparatus is switched on it will indicate the depth continuously at the rate of about twenty soundings per minute. This machine is fitted in many well-known ships, among them the "*Mauretania*," and the

reports received are favourable. I may mention that the two express steamships of the N.D.L., Bremen and Europa, are fitted with this type of apparatus, and the reports from their captains are eulogistic. Closely allied to the subject of echo sounding is that of submarine signalling, which also depends upon the transmission of sound through the sea. The first experience that I had with this type of apparatus was some twenty odd years ago, when the ship in which I was then serving was fitted with hydrophones below the water line, these phones being connected electrically with headphones in the chart room. The sound was produced by a bell attached beneath a lightship or else to a tripod on the sea bed ; the bell was worked mechanically and the sound was transmitted through the water and picked up in the hydrophones fitted to the ship. By means of this apparatus it was possible to obtain a fairly accurate bearing of the sound at comparatively short distances—about 20 miles, and so direct the course of the ship. Speaking from my own experience, I have heard the bell which was then attached to the North West Lightship, off Liverpool, at eight miles distance, but since those days we have progressed considerably, and the oscillator has replaced the bell for sound producing, a much more effective instrument, its extreme range exceeding fifty miles. This oscillator is suspended beneath the lightship and is operated electrically : the first one to be installed was put into service in 1923 in the Nantucket Shoals Lightship, and since that time many lightships and shore stations in Europe and the U.S.A. have been equipped, and their functioning has been successful.

The method of signalling termed synchronous, that is, happening at the same time, consists in the simultaneous propagation of signals through different media, involving a difference in the rate of progression of the several signals, which enables an accurate indication to be obtained at the receiving point, of the distance of the source, by measuring the time interval separating the different signals. For purposes of navigation, the media used are air and water, and the apparatus submarine signalling gear and wireless direction apparatus, and the employment of these systems in this manner may be said to represent the latest aid to navigation yet made available. Although for some years past submarine signalling has been in use, and more recently wireless direction finders, and their combined use has enabled navigators to determine with a great degree of accuracy their direction relative to signalling stations, it is only the co-ordinated use of both systems which admits of the distance of the signalling source being correctly ascertained, and an exact determination of position obtained with the aid of a single signalling station.

Wireless.—This brings me to a discussion of that mysterious, invisible and silent force we term wireless, the most valuable modern aid to the navigation of ships. Oscar Wilde remarked that “ We live in an age when unnecessary things are our only necessities.” This remark may be made to apply to certain so called aids to navigation, but wireless is not one of them : it is now an actual necessity, and in dealing with the ships and men of this generation, too much emphasis cannot be placed upon the inestimable value of wireless as an aid to navigation. The

name of Marconi will be for ever associated with wireless telegraphy and Hertzian waves harnessed to the service of man ; in 1901 he established communication between England and America by means of wireless waves, a distance of about 2,000 miles, and that historical event may, for my purpose, be regarded as the introduction of wireless as an aid to navigation.

There is a Japanese proverb which says " You can stand still in a flowing stream, but not in the world of mankind," and that proverb has very particular application to the world of wireless, for throughout the years that have elapsed since Marconi made his great experiment, much water has flowed in many streams, but mankind has not stood still. With the introduction of wireless telegraphy, the navigator is relieved of considerable anxiety, for by its aid he is able to receive from shore stations and other ships reports of the weather, time signals by which he is able to check his chronometers, information concerning fog and ice, and most important of all, he is able to receive signals of distress, thereby adding to the safety of life and property at sea. A further extension of wireless as an aid to navigation is the Direction Finder, an instrument, of which there are several types, all based on the same principles, for determining the bearing of a distant transmitting station or stations, and so enabling the navigator to determine with accuracy the position of his ship ; in other words, he plots his position by means of wireless cross bearings, in the same manner that we are accustomed to plot the position by cross bearings of visible objects on shore or afloat, with this added advantage : wireless cross bearings are not influenced by fog or mist or darkness. Several methods of direction finding are available and in use : in one method the D.F. is situated on a land station, the bearing of the ship from that station is measured on receipt of a wireless message from the ship, and is transmitted to it. In another method the D.F. is in the ship, and the navigator measures the bearing of any charted shore station that is transmitting ; this is the method in general use at sea to-day. A further method is the rotating beacon, which is really a transmitting station on shore provided with a rotating aerial that can be rotated in azimuth so that it can sweep its signals round the compass as it rotates. The beacon automatically emits a characteristic Morse signal continuously and also a special signal when in a standard position, and an observer equipped with ordinary receiving apparatus, hears the signal wax and wane as the beacon rotates, which it usually does at the rate of six degrees of arc per second, and the special signal is emitted when an observer on the North-South line would hear faint signals, and an observer off that line need only count the number of seconds that elapse between the special signal and the time when he himself can hear the continuous signal least clearly, in order to determine his angle from the North-South line by multiplying by six. The easiest way of performing this operation is to use a stop watch with a seconds hand which makes, like the beacon, one revolution per minute : on hearing the special signal, start the watch, and stop it at the instant of minimum sound, then the angle turned through by the seconds hand is the bearing from the beacon. This type of D.F. is not in general use, the loop system being preferable, and it may be of

interest here to describe briefly that system. In his book on "Direction Finding and Navigation," Mr. Bainbridge-Bell remarks that "the whole object of working D.F. apparatus is as an aid to navigation," and that statement admits of no argument. The first British ship to be fitted with a D.F. apparatus was the R.M.S. Royal George, in May, 1914, and it was of the type known as the Bellini-Tosi. The reports of its functioning were satisfactory, but many improvements in W.D. Finders have taken place since then, the latest pattern consisting of a frame or loop aerial capable of rotation about a vertical axis and associated with a highly sensitive amplifier and headphones. This rotating coil can be fitted on the bridge, on the chart house, or on the usual wireless cabin, and it is needless to state that it is made of non-magnetic metal, so the magnetic compass will not be in any way affected. Beneath wherever this loop is fixed is the wheel which operates it, together with control unit, headphones, etc. When using the apparatus it is imperative to note the actual direction of the ship's head by compass at the same time that the bearing is taken, to enable the true bearing of the distant station to be obtained, and it is also necessary to impress upon navigators that compass readings should always be in degrees from zero to 360, and this method adopted for all wireless calculations.

I may also call attention to the fact that many ships' lifeboats are now equipped with wireless apparatus of limited range, and there is also the Auto Alarm Apparatus for the reception of signals of distress, fitted in those ships which do not carry more than one operator.

In concluding my remarks on wireless, I should like to take the opportunity of mentioning the name of an officer little known among seamen outside the Royal Navy, and one who, in his time, contributed much to our knowledge of wireless, and was the first man in England to put to practical use Hertzian waves for Wireless Telegraphy in the Royal Navy; I refer to the late Sir Henry Bradwardine Jackson, Admiral of the Fleet, and one of the very few officers of the Royal Navy to be honoured with a Fellowship of the Royal Society, one of those distinctions in this country that cannot be bought. In an age which extols publicity, and is remarkable for blatant advertising, it is refreshing to know of a distinguished officer who refused to obey the biblical injunction to let his light so shine before men that they may see his good works, but preferred to leave it to others to discuss his merits. Admiral Jackson died last year at the age of 74, having in his time filled many distinguished positions, among them being that of First Sea Lord.

Barometers and Thermometers.—In this age of wireless weather warnings there is a tendency to relegate these instruments to the limbo of disregarded and despised aids to navigation of a former age, but I think that you will agree with me when I remark that we seamen would be somewhat lonely without them, for in past years they have been our staunch advisers of change of weather. There are two types of barometer in use—the mercurial and the aneroid; the former is being replaced in general use by the latter nowadays, although, being a mechanical instrument, it is more liable to disorder than the mercurial, which only ceases to function when its

reservoir or glass tube are broken, and that is a rare occurrence, although in the days of sail it is remarkable how free from mishap we were with the barometer, when you consider where it was placed. There is no need for me to describe the construction of either instrument, as most of you here are conversant with the instrument in both its forms, but I may perhaps be permitted to remark that there has been, since 1914, a change in the scale used, by the introduction of the millibar in place of the better known inches and tenths. The principal advantage claimed for the millibar as a unit is that it measures atmospheric pressure definitely, whereas the older method indicated the length of a column of mercury, which was not a measure of pressure until the density of the mercury, the temperature of the air and the value of gravity at the place had been allowed for.

For those of us who were nourished on a diet of inches and tenths it is difficult to assimilate the more scientific pabulum of millibars, although I suppose that the younger generation of navigators find no difficulty in digesting such phraseology. For my part, I remain an unrepentant sinner, and still think and speak of the reading of the barometer in inches and tenths, by which act I proclaim myself to be one of the "has beens," who now has nothing better to occupy his time than to meditate upon the mutability of nautical affairs !

A type of barometer not widely known is that form of the aneroid designed by a Spanish priest some years ago, Padre Jose Algué, the then Director of the Manila Observatory, who was an enthusiastic meteorologist and an authority upon those scourges of the China seas called typhoons. I have here one of those instruments and it merits examination ; it consists of an ordinary aneroid barometer graduated in the usual manner with inches and millimetres from 28 to 31 inches, and outside this dial is another movable one, having marked on it divisions indicating the four zones into which Algué divided the storm. The other part of the instrument is the cyclone dial, marked in a similar manner to Piddington's transparent storm cards, with the addition of two movable indicators. This instrument will be easier appreciated by inspection than by any words of mine, but I can speak of its use from experience, and some twenty years ago, when in the Eastern trade, I made its acquaintance and learnt its functions.

Regarding thermometers there is not much to be said, but that they are legitimate aids to navigation, will not, I think, be disputed. The same remarks regarding the graduation of the scale apply as with the barometer ; seamen of this country generally use the scale of Fahrenheit, and are habituated to its use, although for scientific purposes the simpler Centigrade scale is preferred ; there is a third scale named after René Réaumur, but it is almost obsolete so may be disregarded. As most of you are aware, his scale was marked from zero, freezing point, to 80 degrees as boiling point. With "absolute" temperatures I am not concerned : they are in the domain of scientific meteorology, but in passing, I may mention that "absolute" temperature is Centigrade increased by 273.

In dealing with thermometers as aids to navigation, it must be borne in mind that in conjunction with the barometer, these instruments are real aids, as by their

use it is possible to presage the weather, especially in conjunction with the excellent charts issued by the Meteorological Office, and the universal use of wireless telegraphy.

Whistles and Syrens.—In the “Merchant of Venice” Shakespeare speaks of “the vile squeaking of the wry-necked fife”: I have wondered how that lord of language would have described the noise made by whistles and syrens? And yet they have their function as aids to navigation, for by international law they must be used for signals under certain conditions, and in mentioning whistles and syrens one must not disregard the modest, yet extremely vocal, hand worked fog horn used by the despised and neglected sailing craft, for there are still some deep water ships ploughing the deep, not under our flag, it is true, and there are numerous fishing craft whose motive power is wind, so it is necessary to include the fog horn as an aid to navigation; in my young days at sea, when on the forecastle head on the lookout, the fog horn was not only regarded as an aid to navigation, but also an aid to the development of the arm muscles.

There has recently been brought to my notice a system of course signalling by means of the whistle or syren; I will admit that I have had no experience with it, neither have I devoted particular study to the system, but do not permit my remarks to deter anyone who is interested from making investigation. The only objection that occurs to me is the well known one regarding the vagaries of sound in air and in fog, it being generally admitted that the transmission of sound in fog is not to be relied upon with any degree of certitude, particularly regarding direction. The system to which I refer is known as the Janus System of Continuous Course Signalling, and I shall be pleased to give what information I have on the subject to anyone at the end of my talk to-night.

In speaking of whistles it is necessary to remind some of you, and inform others who may not have had experience with them, that many ships are now fitted with an electrical automatic device for manipulating the whistle in fog; the mechanism may be set for the regulation blast of 4 to 6 seconds duration every two minutes, or for any other period, and when it is switched on, the whistle functions at the prescribed periods automatically: electricity is also enlisted for sounding the whistle or syren, by the simple operation of pressing a button on the bridge, thereby doing away with the time honoured lanyard, the manipulation of which compelled many of us to the use of profanity as we felt the icy water from the lanyard slowly but persistently trickling up our defenceless arms as we grasped and pulled in the execution of our duty. The man who invented the automatic and electric device for operating ship's whistles was surely one of the choice and master spirits of this age, and merits the enduring regard of all watch-keeping officers.

Before concluding my remarks on whistles I should like to call your attention to a suggestion worthy, I think, of consideration, and that is the position in which whistles and syrens are usually fitted in ships—the fore part of the funnel or funnels. In my judgment that is a most unsuitable position, for when in operation the noise is distracting to the officer of the watch and disturbing to passengers, and we might

follow the example set by some other nations, notably the French, for as long ago as 1907 I had noticed that the Atlantic mail steamers of the French Line had their syrens fitted on the foremast in a similar manner to the mast head light. In that position the sound emanating from the whistle or syren was clear of all obstructions, the officers on the bridge were not deafened with the noise, it was far removed from passengers' quarters, and it also served the purpose of ensuring that the lookout men in the crow's nest were awake! It may interest you to know that in the new ships, Bremen and Europa, the whistles or syrens are placed in this position.

Binoculars and Telescopes.—There is not much to say about these instruments beyond the fact that they are very material aids to navigation, especially in this age of speed. There are two forms of binocular used by mariners, the Galilean and the prismatic: the former is the ordinary binocular fitted with ordinary lenses having a magnification of about $3\frac{1}{2}$ diameters for sea use: the larger lens or object glass serves the purpose of collecting light, the smaller lens or eye piece is for magnification of the image. The prismatic binocular serves the same purpose as the Galilean, but by the insertion of prisms, the magnification is increased considerably; both types are made with central as well as eye-piece focussing, and both types are to be obtained hinged. Many seamen condemn the prismatic binocular, especially for night use, but I think that the fault lies with themselves, for they use a glass having too high a power of magnification, thereby causing unsteadiness in the image reflected. The most useful power is 6 both for night and day use, although many officers prefer 8. In the new standard Admiralty glass a compromise has been effected, with a magnification of 7 diameters, the result being a binocular with a wide field, great clarity of definition and freedom from all discolouration at the edges, technically termed chromatic aberration. This type of binocular is weighty, but that is, to my mind, an advantage, for one can maintain greater steadiness, and sailors do not usually suffer from palsied arms.

The properties of the telescope are those of the binocular with increased magnification: they are not so handy as the binocular, but they are necessary adjuncts to the equipment of every ship and every officer. The two patterns in general use on board ship are those known as the Officer of the Watch telescope, and the larger and more powerful glass; the former is usually the personal property of an officer, the latter belongs to the ship. Telescopes and binoculars have one property in common if they are to be effective—they are costly, for the process of grinding lenses is an expensive one. Cheap aids to vision are costly in the long run, and as a good glass lasts its owner for his lifetime, it is worth paying for.

That brings me to the end of my list of aids to navigation for tonight: I have endeavoured to make interesting a dry subject, and I appreciate your attention. Some of you may be of the opinion that I have unduly stressed some of these aids, but I would remind you that no progress can be made without investigation, and all the instruments that I have dealt with so far deserve consideration. If I may be permitted to suggest a further not unimportant aid to navigation, it

would take the form of an aid to correct nautical phraseology and detail for the use of journalists and film producers : both stand in need of it.

In conclusion, as I have been dealing with the appliances for navigating ships, it will be permissible to quote to you three or four lines of Masfield's apropos ships : they express our national sentiments, I hope.

" They built great ships and sailed them " sounds most brave,
 Whatever arts we have or fail to have ;
 I touch my country's mind, I come to grips
 With half her purpose thinking of those ships.
 They are my country's line, her great art done
 By strong brains labouring on the thought unwon.

CORRESPONDENCE

FESTIVAL OF ENGLISH CHURCH ART

Whilst thanking you for your appreciative note on the exhibition, which appeared in the *Journal* dated June 27th, I should like to correct an error. This was by no means the first exhibition ever organised by *The Church Crafts' League*. We hold exhibitions every three years but, on this particular occasion, non-members were allowed to exhibit for the first time.

The League is an advisory body formed over 30 years ago to assist those who may wish to add some beautiful work to a Church or even to build one and more than two thousand Churches have benefited already by its advice.

P. A. ROBSON, F.R.I.B.A.

Chairman, Church Crafts' League and of the Hanging and Planning Committee of the Festival Exhibition.

NOTES ON BOOKS

A DETECTIVE IN KENT. Written and illustrated by Donald Maxwell. London : The Bodley Head. 6s.

We like to be told about attractive and out-of-the-way places in the country, yet generally we bear some grudge to our informant (if he expresses himself in print) for not managing to keep his knowledge a secret between himself and us. Secrets do not *leak out* for long ; they become a raging flood. It is the same with country secrets as with others. The result is that the secluded wood becomes a hive of picnickers, the little inn begins to turn up its nose and push up its prices.

Mr. Maxwell's present book suggests the most charming rambles, but without causing us any anxiety. He is not a romanticised Baedeker, but a " landscape detective," and if we decide to become landscape detectives ourselves, we shall want to attack problems that Mr. Maxwell has not already solved for us. On the other hand, should we live or happen to be travelling in Kent, we may read more between the hills and hedges if we have first read his book, than if we have not had the benefit of Mr. Maxwell's knowledge of strategy, philology, geology and arborology.

Mr. Maxwell has illustrated, as well as written, several country books, and many who may not have opened one of these are certainly familiar with his railway posters. He is as ingenious and suggestive in Indian ink as in blue-black.

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No. 4055

FRIDAY, AUGUST 8th, 1930

VOL. LXXVIII

All Communications for the Society should be addressed to the Secretary, John Street, Adelphi, W.C.2.

NOTICES

COMPETITION OF INDUSTRIAL DESIGNS

A selection of the Designs received in the above Competition for Prizes and Scholarships offered by the Society and well-known manufacturers is being exhibited, by kind permission of the Board of Governors, in the Exhibition Pavilion of the Imperial Institute, South Kensington, from the 2nd of August to the 31st August, both inclusive, every weekday from 10 a.m. to 5 p.m., and on Sundays from 2.30 to 6 p.m.

The Exhibition is open free of charge ; no tickets are required. It will include Designs for Architectural Decoration, Textiles, Furniture, Printing and Book Production, Pottery and Glass, and for Posters, Showcards, etc.

Several important firms have expressed a wish to offer Prizes for Designs in connexion with the 1931 Competition.

A Bureau of Information has been established at the Royal Society of Arts in connexion with the Competition, for the registration of the names and addresses of exhibitors who desire to obtain employment as designers. These lists are at the service of manufacturers in search of designers.

A report on the competition, including full lists of awards, will be issued at a later date.

HISTORY OF THE ROYAL SOCIETY OF ARTS

Further copies of the History of the Royal Society of Arts by the late Sir Henry Trueman Wood, the existing supply of which was recently exhausted, are now available, and can be obtained, price 15s. net, on application to the Secretary. The History, a large octavo volume of 558 pages with a large number of illustrations, gives a well documented account of the many and various activities of the Society from its foundation in 1754 to the year 1880.

PROCEEDINGS OF THE SOCIETY

THOMAS GRAY LECTURES

AIDS TO NAVIGATION

By COMMANDER F. G. COOPER, R.D., R.N.R.

LECTURE III.—*Delivered April 7th, 1930*

In dealing with the mariner's compass in my first lecture, it has occurred to me since that I omitted to mention a great improvement that has been effected in the magnetic compass of recent years ; I refer to that form of the compass designed by Dr. G. T. Bennett, F.R.S., and known as the Dead-Beat. It was developed at the Compass Observatory at Slough and without a compass in that form it would have been impossible to navigate airplanes over long distances. This is a liquid compass in which the card only weighs 2.5 grammes : the light card of the Thomson Compass weighs 15 grammes, and the old type of Admiralty Compass card weighed 44 grammes. In order to obtain steadiness in a compass card, it is necessary that its oscillations be checked : this is effected in the ordinary compass by floating the card in spirits, but the drawback to this type of compass is its tendency to sluggishness ; with the Dead-Beat Compass called Husun, and made by Messrs. Henry Hughes & Son, from the design of Dr. Bennett, the oscillations are damped out by the use of fine radial filaments and two short but powerful magnetic needles made from cobalt steel ; these needles are $2\frac{1}{2}$ inches long with a $6\frac{1}{2}$ inch card in a 10 inch bowl. The use of such a card gives these results : Deflected 45 degrees it returns to zero in 11 seconds. Swings only 5 degrees beyond zero and returns to rest in 35 seconds. It will be obvious that this type of compass gives great steadiness, and is a great improvement over any other form of magnetic compass.

Clear View Screens.—Having in the course of my two former lectures dealt with most of the principal aids to navigation, I have still to deal with some important and very material adjuncts to the safe navigation of ships, so I will commence this talk by referring you to the Clear View Screen made by Messrs. George Kent Limited. It is not by any means a recent invention, for it has been in use for many years past in all types of ships, both of the Royal Navy and the Merchant Service, and it deserves to be included as an aid to navigation. Every seaman knows the difficulty and discomfort of trying to look out against rain and spray, and the utter uselessness of his glasses under these conditions. In the days of masts and yards our protection from the weather consisted of a canvas weather cloth lashed outside the mizzen or jigger rigging, and a strip of canvas round the whole of the poop from rail to deck. This was primitive, but it served the purpose, and even had they been available in those days, I doubt if Clear View Screens would have

been of much use. There was a type of shipmaster, and for all that I know to the contrary his type is still in existence, who opposed on principle all new-fangled notions, and even carried his bigoted ideas to the extent of prohibiting any form of shelter on the bridge but the merest wisp of a canvas dodger, and that only in heavy weather. It has been my undeserved misfortune to serve under the command of men of that type, and I do not cherish their memory with any feelings of piety. One can imagine such men becoming marine superintendents, and the discomfort officers would have to endure through their ignorant perversity ; the mention of a Clear View Screen to them would evoke an outburst of indignant and scornful profanity, and there are so-called shipowners to-day who would support them for obvious reasons ! Fortunately, the wide prevalence of education is producing a different class of seamen to those bluff and hearty sea dogs, beloved of passengers and journalists, but execrated by their unfortunate officers, and to-day we see most ships equipped with suitable shelters from the weather on the bridge, even if they are not all fitted with Clear View Screens. This screen consists of a highly finished glass disc of about 12 inches diameter, rotated in its own plane on a central bearing by an electric motor, at such a speed that rain, spray and falling snow are instantly dispersed, and a clear view ahead is obtained, with or without the aid of glasses. The fitting is made in two different types, the Hood and the Window, the first being suitable for open bridges and all cases where it is required to view a wide arc of the horizon : the other type is for use in either chart room or wheelhouse. In the Hood type the mechanical unit is mounted in a metal hood that can be rotated upon a pedestal : inside the hood are teak elbow rests, so that the observer may have his head and shoulders under shelter and so be able to use his glasses with effect, and by the pressure of his elbows he is able to swing the hood to any position. Inside the hood there is fitted a pelorus or dumb compass card, for taking bearings, and in the latest pattern hood, in addition to a larger glass disc, there is fitted an azimuth mirror or prismatic sight for taking more accurate bearings, also a glare guard of tinted glass. In the Window type of screen the mechanical unit is mounted within a hinged metal plate fitted to a teak wood frame that can readily be substituted for any existing window in wheelhouse, chart room or bridge-end shelters or sentry boxes ; the metal frames are hinged so as to open inwards for cleaning purposes, and it is as well to state that all metal parts are non-magnetic. The Clear View Screen is without doubt an invaluable aid to navigation and a boon to navigators, although I have no doubt that we still have among us those hardy mariners who scoff at such aids to comfort and sneer at those who advocate their use.

Logs.—In a lecture of this description it is necessary in dealing with the various aids to navigation, to trace their evolution from a primitive state, so I will touch briefly on the predecessor of the patent log, the old hand log with which many of you are acquainted. The method in general use for obtaining the speed through the water of ships throughout many generations and ages was by the use of the log line and the glass. The principle was that of proportion, *i.e.*, the amount of

line between the marks bore the same proportion to a nautical mile as the seconds of the glass bore to the seconds in an hour. The calculation was simple, and in years gone by formed part of a second mate's examination, but I don't suppose that such elementary questions are asked nowadays, although I speak subject to correction. Having obtained the relative length of line, that length was carefully marked off on the deck, the line was well stretched and wetted, and some fifteen or twenty fathoms having been measured off and marked with a piece of rag, the amount required to represent one knot was measured from the rag, and at one knot a leather tail was tucked in : at two knots two leather tails or ends, and at three knots three ends of leather ; at four knots we had a piece of fishing line with two knots, at five knots a cord or line with one knot, at six knots three knots and so on. In some ships it was customary to mark each knot with the same number of knots on the line, but from my own experience in sailing ships, the first method was the one adopted. This method of measuring the speed was good enough in the leisurely days of sail, but with the introduction of steam, it was necessary to have a simpler and more expeditious method of ascertaining the rate of travel, so the mechanical log came into general use. The earliest form of patent log was invented by Massey as far back as 1802, and his log continued in general use until the introduction of 'Thomas Walker's harpoon log in 1861 : that form of log was towed astern, and the metal body, to which was attached the blades, contained the mechanism, and also the dials which registered the distance run, so that it was necessary to haul in the log every time the distance was required, a tedious and slow process, but nevertheless, an improvement on the old line and glass method. As I remarked in a former lecture, the Japanese have a proverb which says that " you can stand still in a flowing stream but not in the world of mankind," and the inventive mind of man improved upon this type of log when Walker produced his well-known Cherub log, which consisted of the rotator towing at the end of a suitable line of about 50 fathoms in length and attached to a dial fitted to the taffrail which registered the speed. In order to regulate the spin of the log, a brass or other metal flywheel was introduced which acted as a governor. This log gave excellent results at moderate speed, but over 14 or 15 knots the rotator was inclined to jump out of the water, so the Trident pattern log was introduced, an instrument of similar appearance to the Cherub with a longer line—about 65 fathoms, and this log served and still serves a useful purpose, and is to be relied upon under all ordinary conditions of speed and weather. A further improvement was introduced by the firm of Walker by the application of electricity to their Trident log : by its aid it was made possible to repeat the indications of the taffrail on a dial in the chart room or on the bridge. Of late years it has been the custom in ships of 400 feet or over in length to tow the log from a boom rigged out amidships : this fitting is termed the Viking Connector, and is fitted at the end of the boom which is suitably rigged with guys and stays.

The advantage of this type of fitting is that the log register can be fitted directly under the eye of the officer of the watch in either of the bridge shelters, and it has

the additional advantage of being towed clear of the wake, or of any floating refuse. The mechanism of the Connector runs in solidified oil, so the question of lubrication need not worry the navigator at sea: in port, when overhauling the log, the oil can be replenished with little trouble. The firm of Walker, so well known in the world of shipping, have contributed considerably to aiding navigators by supplying them with the means of measuring their distance run and their speed, but despite the utility and accuracy of towing logs, there is a field for the inventive genius of man to explore by designing a reliable mechanical ship's log. However accurate and true the towing log may be, the fact remains that it is a towing log, with the drawbacks attached to towing, *i.e.*, the possibility of the rotator being fouled by floating refuse or weed, or being lost altogether, neither being impossible contingencies, and it is also to be taken into consideration that the rotator must be hauled in board when the ship stops, either for a pilot or in an emergency. With the rotator towing alongside, it would not be a matter of grave importance if the officer of the watch overlooked having it hauled in, but when towing astern, it is another matter, and officers are not infallible. It may be permissible for me to mention, in connection with logs and knots, that a knot is not a nautical mile as is so frequently assumed; the knot is the unit of speed at sea, and in navigation the unit of speed is one nautical mile per hour and is called a knot. If a ship steams or sails through the water 6,080 feet x 10 in an hour, she is said to be making 10 knots, from which it is evident that in the frequently used expression "knots an hour," the words "an hour" are redundant and convey no meaning. Joseph Conrad remarked that "exactitude in small matters is the very soul of discipline," words of wisdom worthy to be committed to memory.

Before dealing with mechanical logs, I should like to draw your attention to examples of the earliest and the latest form of towing log. I have here a patent log made by Massey and supplied to H.M.S. "Victory" in 1802; I understand that this log was used in that famous ship on several cruises and in several actions. The other log which I am going to show you is the latest product of the firm of Walker, and was supplied by them to the N.D.L. steamship "Bremen," and used by her on her record-breaking voyage last year. It is fair to state that the line supplied with this log, which was towed alongside in the manner already described, would not stand up to the strain of a speed of over 28 knots for 3,000 miles continuously, but a special line was supplied, the last report received being favourable, and the log showed an error of 6 miles in 3,800—less than $\frac{1}{2}$ per cent., a meritorious performance.

I should like to mention that the patent log is not such a recent invention as most of us think, for in his book, "Yacht Cruising," Dr. Claud Worth tells us how he read in a book, which he bought from a barrow in the street, a description of what was to all intents and purposes a patent log which was used prior to the Christian era. The book in question is entitled "De Architecturâ," a general treatise on engineering written by M. Pollio Vitruvius about the year 20 B.C. I have with me a translation of the description of the ingenious device mentioned.

Having dealt with the old-fashioned log and the various forms of towing logs, I come to the mechanical types, of which there are several, but up to the present they are not instruments of absolute perfection. The first one to be mentioned is known as the Forbes Log : it indicates the distance travelled through the water by the ship, and also the speed in knots at which the ship is moving through the water at any given moment. The transmitting apparatus consists of a tube projecting through the bottom of the ship and turned so as to face forward. Water is forced through this tube by the forward movement of the ship, and this pressure or flow of water operates a small propeller which actuates the transmitting mechanism. The water flows out through an opening facing aft. The small propeller operates a commutator which transmits electric signals to the recorders. The whole of the tube which projects through the bottom of the ship can be drawn inboard at any time and the valve closed ; this type of mechanical log is better known in the Royal Navy than the Merchant Service. Another mechanical log operated on a somewhat similar principle and not yet widely known, but which has undergone a long series of trials, is known as the Pitometer Log. It is an instrument based on the principle of the Pitot Tube, a principal which has been used by hydraulic engineers for many years in connection with the measurement of the velocity of the flow of water. I may mention that a Pitot tube consists of a bent tube with a small orifice pointed in the direction from which the flow is coming, and this tube is surrounded by a second tube whose direction is parallel to the first, and is pierced with a number of small holes to admit water at the mean pressure of the flow. It is by an adaptation of this device that the Pitometer log is constructed and is independent of impellers or propellers, but like all mechanical logs, depending for their functioning upon a tube projecting through the side or bottom of the ship, it is liable to be affected by what is called skin friction, and it is necessary that the rod or tube be placed in a position determined by the lines of the ship, and at a sufficient distance from the plating of the hull to be clear of the influence of this friction. The mechanism of the Pitometer log is partly electrical and partly pressure, the electrical part being that which is used for the transmission of the impact to the recording dials. All the reports that I have been permitted to read of this instrument indicate that it is based upon a sound principle, and its functioning under all conditions of speed and weather has been highly satisfactory. At the present time the log is undergoing exhaustive trials by the Admiralty.

The log known as the Chernikeeff Log has been on the market for some years and has also undergone considerable trials. It is the invention of a Captain of the late Imperial Russian Navy, who brought it to this country in 1921, when it was installed in one of H.M. submarines and subjected to trial ; the result of the trial was satisfactory and other of H.M. ships were fitted with it, and accurate results were obtained at speeds from half a knot to 33 knots. The Log consists of hull fittings, *i.e.*, sluice valve and log casing carrying the impeller, the master instrument or recorder, and additional repeaters as required. The submerged mechanism is

carried in the outboard projection, which is fitted according to the design of the ship and having regard to skin friction ; this position is usually well forward of amidships, but varies in different types of ships. The mechanism runs in an oil bath and is completely watertight, and it is connected by insulated wiring with the accumulator and instrument box in the chart room. Current for working the log is obtained from a small voltage accumulator or dynamo. It is claimed for this log that the impeller has no slip and therefore its readings are accurate under all conditions. As regards its standing up to constant running at high speeds, I have no information, but in these days of speed, that is a necessary condition in a mechanical log claiming to be perfect, but all my information obtained from disinterested sources, assures me that we have not reached finality regarding mechanical logs, although it is certain that the genius of man will in time produce the perfect instrument, but the time is not yet. In dealing with mechanical logs for commercial purposes, the cost must be taken into consideration, and when it amounts to as much as ten times that of the complete towing log, ship-owners will require considerable inducement to have them fitted in their ships. I omitted to state that with both the Pitometer Log and the Chernikeef, there are accessories in the shape of speedographs or continuous recorders to be placed in the chart room : they record on a moving paper band a continuous record of the vessel's speed throughout 24 hours, and the paper is ruled both ways to indicate both speed and time. With this fitting and the Gyro Course recorder in the chart room, together with the Echo Sounding machine and Directional Wireless, navigation should be a comparatively easy task compared to what it was in the old days, and if owners would only devise some form of steam or electric heaters for the bridge, thereby adding to the comfort of officers when on watch, it is certain that those who go down to the sea in ships so fitted will have little to complain about so far as personal comfort is concerned, but even then I expect they will have a growl about either food or pay or both !

The Leader Cable.—Although wireless aids and echo sounding have superseded this device, it is worthy of inclusion in these lectures, so I will describe it briefly. It was, and I believe still is, in use in the channel leading into Portsmouth Harbour and in the Ambrose Channel leading up to New York Bay. It was intended to facilitate the navigation of vessels in pilotage waters during fog, when the usual aids to navigation such as buoys, lightships, landmarks and beacons were obscured.

The apparatus comprised transmitting gear, which consisted of a submarine cable laid in the channel where it was desired to facilitate navigation. One end of the cable was taken to a transmitting station on shore and connected to one terminal of an alternating current dynamo ; the other terminal of the alternator was earthed, preferably to the sea. A signalling key was inserted in the cable at the transmitting station which allowed the current to be broken and made in accordance with any pre-arranged signal or Morse letter.

The receiving apparatus consisted of two coils of wire placed on each side of

the ship or vessel ; these coils were connected by means of leads to the receiving apparatus and telephones installed on the bridge. They were fixed in a suitable position, usually forward and at an angle with the ship's side, and they picked up the electric waves emanating from the cable on the sea bed : the range at which it was possible to detect signals from the cable was largely increased if two flexible wires of unequal length, suitably insulated, with their towing ends laid bare of insulation so that they made good electrical contact with the bottom, were towed astern and used in lieu of the twin coils. The inboard ends of the cables were connected to the receiving gear, and when the signals were distinct and it was certain that the ship was near the Leader cable, the electrodes were disconnected and the coils connected. By listening for the signals to increase or decrease in strength, it was possible to maintain the ship directly over the cable or a little to one side as required, and so enter the harbour and take up a suitable anchorage. The signals were audible under average conditions and using the towing electrodes, for about 1,200 yards. If it had been considered advisable to extend this system, it would have been necessary to have two cables fitted, one for inward, the other for outward bound ships, but, as I said, W.D.F. and echo sounding have put this system out of action. A full account of its use is to be found in a pamphlet issued by the Admiralty, with the title "Technical Notes on the Leader Cable System ;" a briefer description is to be found in the Admiralty Manual of Navigation, Volume I.

Star Charts and Globes.—These are minor but very useful aids to navigation : the star globe is not usually found on board ship, but it should be found in every well-equipped chart room ; the cost is not prohibitive and the manipulation simple. There are many officers who prefer Star Charts : there are several published but, speaking for myself, I have always given preference to those of Count de Miremont : they are, I believe, published by George Phillip & Co. There are others—Brown's, Whall's, and in Lecky's Wrinkles the star charts will serve the purpose of any beginner at nautical astronomy.

Tide Charts.—These again are necessary to the complete navigator, one of the best being Whall's well-known Book of the Tides, but there are others, notably the Admiralty publication called Tidal Streams. They all serve the purpose of indicating the state of the tidal stream each hour before or after High Water at Dover, in the English Channel, North Sea and Irish Channel, and for navigating those intricate tidal waters they are invaluable aids to navigators.

Charts.—I suppose many of those seamen present who have endured me with patience, have wondered whether it was my purpose to include charts as aids to navigation, and although I have left their discussion to the end, they are certainly not the least valuable aids to navigation, for without them, where should we be, and what would be the use of all our complicated and modern instruments for

finding our position if we had no charts to guide us? It would be possible to make charts and their history the subject of a complete lecture, but in the time allotted to me I can only touch briefly on their use as aids to navigation. It is stated, and I think with truth, that the Royal Navy is a silent service, but a service even more reserved is that branch of the Royal Navy known as the surveying branch, which branch is presided over by the Hydrographer of the Navy. If international conventions, pacts, treaties, or what not, decide to abolish all naval armaments, they will have to retain the Hydrographic Departments of the various navies, for without their work, the sea-borne trade of the world could not function, for they are the chart makers: theirs is the duty of providing us with maps of the sea and the sea coasts, so that we may be able to pursue our lawful occasions in peace, quietness and safety.

The chart used for all ordinary purposes of navigation is drawn on Mercator's projection: for polar work it is necessary to adopt a different projection, so that known as the gnomonic projection is used, but it is not necessary to enter into details of that projection, as we seamen rarely have occasion to use it. Mercator's projection delineates on a flat surface like a chart, the curved surface of the earth; all parallels and meridians of the globe cut each other at right angles, and so that they may do so on the Mercator chart, the meridians are drawn as straight lines parallel to one another. In order to retain the correct shape and comparative size of objects as far as possible, it becomes necessary in constructing a Mercator chart to increase every degree of latitude in exactly the same proportion as the degrees of longitude have been lengthened by this projection. 'This is done by the aid of what we call meridional parts, parts which have no real existence; they have been calculated and tabulated for us by those useful fellows one finds in Universities, called mathematicians; we seamen are under considerable obligation to them, for without their knowledge and labour, few of us would be able to construct our own navigational tables. These artificial parts for any given latitude are the number of nautical miles by which that latitude would be distant from the Equator if every degree and minute between them had been lengthened in proportion as the longitude had been lengthened. For example, the proportional parts for latitude 50 are 3474.47, but the actual number of nautical miles between the Equator and latitude 50 degrees is $50 \times 60 = 3,000$ miles. The difference between them, 474.47 is the amount by which the distance from the equator to 50 must be increased on a Mercator's chart of the world, in order that a mile of latitude at 50 degrees may be in true proportion to a mile of longitude at latitude 50. All this will be elementary to many of you, but it is necessary to consider those present who are not navigators, hence my discursiveness. For the benefit of those same people, may I be permitted to add a few words on the often-discussed question of miles; I have already discussed the knot as the unit of speed so that it does not concern the question of measures of length. We have the three different lengths of a mile: the nautical mile which is accepted as having a mean length of 6,080 feet; the geographical mile which may be taken as one minute of longitude at

the Equator and is 6,087 feet ; the statute mile which is 5,280 feet. There is also the cable, which, for the purpose of practical navigation, may be regarded as 100 fathoms in length, ten cables being taken as the equivalent of one sea mile. Having made clear the measures of length in general use, it may be of interest to touch upon the history of chart making ; it is not generally known, even among seamen, that systematic chart production was unknown in this country until the end of the seventeenth century, for, until that time, it was to the Dutch that we were indebted for our charts and sailing directions. In the year 1670 one John Seller established himself as a chart publisher at "The Sign of the Mariners' Compass," in Wapping, and there he published his famous English Pilot. From 1670 to 1795 all charts issued in this country, and used by both the Royal Navy and the Merchant Service, were supplied by private firms, and information was supplied by officers of the Royal Navy and many famous explorers, principal among them being James Cook. It was not until 1795 that the government, having purchased the collection of charts from the East India Company, founded the present Hydrographic Office of the Admiralty. For the following half century the private firms were entrusted with the production of charts for the Royal Navy, which were compiled from information supplied by the Admiralty and from individual officers of the Royal Navy. As the production of the Hydrographic Office increased, the need for relying solely on private enterprise diminished, but private enterprise still continues to publish charts, the famous Blue Backs being produced by the house of Norie and Wilson, a firm whose history as cartographers goes back to the year 1765. Throughout that long period they have continued to make charts and compile sailing directions, those necessary adjuncts to all charts, general or particular. We all know the Admiralty charts, many of us know the Bluebacks, but there is a widely prevalent idea among navigators that it is almost, if not quite, illegal to navigate with a Blueback, and I take this opportunity of dispelling that erroneous idea. If a ship is navigated with a chart corrected to the date of the latest survey, whether it be Admiralty, Blueback or any other, the navigator will not be held to blame by any Court of Inquiry for using other than Admiralty charts, should he be in the unfortunate position of having to answer to a Court for the navigation of the ship entrusted to his charge ; if, on the other hand, the navigator is involved in a stranding or worse, and it is proved that his chart, although the production of the Admiralty, was out of date, he will have to endure the consequences. The moral of all this is to warn navigators to satisfy themselves that their charts are corrected to date, otherwise they may find themselves involved with a legal tribunal ! Closely allied to charts are the sailing directions which accompany them : most of those in use to-day are issued by the Admiralty from the work of the Hydrographic Department, although private enterprise is not prevented from publishing sailing directions for use with their own charts. One of the best-known books of sailing directions is published privately by Norie and Wilson ; it is safe to assume that it is known to most seamen : I refer to the Pilot's Guide to the English Channel, usually known as King's Channel Pilot.

Sailing Directions are not to be regarded as coming within the realm of imaginative literature, but nevertheless they make interesting reading, and they have the merit of being entirely free from all fiction. Truth and fidelity radiate from their pages, for the safety of life and property at sea largely depend upon an intelligent appreciation of the printed matter contained in them. A character termed the mariner is frequently mentioned in these fascinating volumes, but he appears to have been a lawless person judging by the number of warnings to which he is subjected : you will find him being warned not to approach certain shores too closely, because they are badly lighted : he is warned that he must not attempt to land on such and such islands, for the reason that they are inhabited by cannibals ; he is warned that other islands have no fresh water and, taking all these warnings into consideration, one is forced to the conclusion that the mariner referred to lived a life of constant anxiety, filled with perils and hardships. Those of you who are interested in the affairs of this person will read all about him in any volume of "Sailing Directions"—preferably that pertaining to the North and South Pacific Oceans. Closely allied to sailing directions are Notices to Mariners : they are issued by the Admiralty, the Board of Trade and Trinity House, their purpose being that of supplementing the sailing directions by informing the mariner of the latest corrections to those volumes. They are to be obtained gratis from the various Shipping Offices, and from Potter's, in the Minories, the Admiralty chart agents, but their perusal will not inspire the minds of men to great deeds : they are prosaic, and yet they serve a very definite purpose by helping to remove obstacles from the course of the navigator. They form the subject of an entertaining essay by the late Joseph Conrad, and perhaps if I read an excerpt from that essay, you will appreciate its quality and may be urged to read it in its entirety.

"Addressed to a special public, limited to a very definite special subject, having no connection with the intellectual culture of mankind, and yet of some importance to a civilisation which is founded on the protection of life and property that prose has only one ideal to attain, to hold on to : the ideal of perfect accuracy. I often wondered what the author of the 'Notices to Mariners' looks like. I have tried to represent him to myself as a monk, a man who has renounced the vanities of the world, and for preference belonging to the Order of Trappists, who are bidden to remember death, and nothing else. A sobering thought. Just suppose the author of 'Notices to Mariners' acquiring convivial habits and sitting down to write a Notice in that happy frame of mind when nothing matters much and one letter of the alphabet is as good as another ! One letter is so soon written for another—with fatal results."

From Sailing Directions and Notices to Mariners it is an easy step to the various books dealing with the science and art of navigation ; it only remains for me to deal with a few of those that are of importance, and the first to be mentioned is that priceless volume called Nautical Tables ; without its aid we should be unable to navigate with any degree of accuracy, although there are bound to be certain

individuals, called X chasers, who would be able to compile their own Tables, but they are rare—like teeth in oysters ! The most popular volume of Tables is that known as Norie's : you all know it, and words of mine will not add to its value ; another well-known volume of tables is that of Raper, and another, not so well known, is the excellent volume of Inman's, better known in the Royal Navy than the Merchant Service. With so-called Guide books I am not concerned : they are not aids to navigation, but aids to cramming, and with the advent of the new examination syllabus next year, most of them will cease to function, for the reason that the new syllabus does not lend itself to cram books ; something more substantial will be necessary and, expressing my own opinion, I favour the Admiralty Manual of Navigation, latest edition ; it is a work complete in itself concerning the science of navigation, and deserves a wider recognition among officers of the Merchant Service, and used in conjunction with standard text books on mathematics, it should carry the navigator safely through the rocks and shoals of the examination room, and be a guide, philosopher and friend to him during the years of his seagoing. It is not my purpose to deal with the many books treating of navigation : their selection is a matter for the individual, but I have been so frequently asked to recommend a good sound text book on Seamanship that I will take this opportunity of expressing my preference, although it must be admitted that seamanship cannot be acquired through the medium of books or, for that matter, through a correspondence school, which I am informed exists ! The work to which I refer is by an American Merchant Service officer who was for some time in command of the sea-going training ship " Newport," and is himself a seaman of wide experience and sound judgment ; it is entitled " Seamanship," by Captain Felix Reisenberg, and although expensive, it is a sound text book.

I now have only one more aid to navigation to tell you of, and that has not yet been thoroughly tested : I refer to what is called Noctovision, which, as its name implies, means the power of seeing in the dark, and applied to the navigation of ships, it means even more than that—it means the power to penetrate fog, and my information on the subject, gleaned from the scientific staff of the Baird Television Company, by courtesy of the manager, is that up to the present time, they have successfully penetrated a thick London fog for a distance of 500 yards. That is not much, but, to quote Tennyson :

" Science moves but slowly, creeping on from point to point."

and if the genius of the human mind has been able to achieve this much, it is certain that it will in time achieve much more, so we seamen await with patience the advent of this, the latest aid to safe navigation. My scientific knowledge is scanty, but for your information I will read to you what was written for me by the inventor.

Noctovision Applied to Navigation in Fog.—Noctovision is the science of seeing at night or in total darkness. It has come to mean the science of detecting light sources in fog. For this purpose, radiations of long wave length are used, as the penetrative power of light through fog is dependent on its increasing wave length.

These long waves, or infra-red radiations, are emitted by all light sources, and although invisible to the human eye, are readily detected by certain types of photo-electric cell. In the Baird "Noctovisor" a suitable slotted disc is rotated at the focus of a lens, and a photo-electric cell is placed behind the disc. The infra-red image of the distant light source is analysed by the rotation of the disc, and corresponding variations in current are given by the photo-electric cell. These variations are amplified sufficiently to cause a neon glow lamp to flicker. This neon tube is placed at a point diametrically opposite to the cell on the circumference of the disc, and when observed through the rotating disc an image of the distant light, visible to the human eye, is built up. By using one disc, the difficulties of synchronisation are obviated. By mounting a Noctovisor in gimbals and arranging it to move in azimuth, the bearing of a distant light in relation to the fore and aft line of the ship, may be ascertained, even if fog intervenes. Suitably arranged, this apparatus should be of great use as an aid to navigation in fog, both at sea and in the air. It is hoped to have perfected apparatus ready for use at sea within a few months.

I have now come to the end of my task, and I hope that I have made fairly clear to you the many modern aids to navigation. I have endeavoured to confine myself to legitimate, not factitious aids to navigation, and it has been my object to be impartial when describing the products of various manufacturers. We live in a progressive age and it is difficult to foresee what the future will produce to aid us in navigating ships; there are many of you present old enough to have seen, as I have, changes so rapid, improvements so great and ships increase so much in size, since we first commenced to "follow the sea," as the phrase goes, that within the next decade or two it is reasonable to visualise an age so mechanical that it will be possible to control ships from positions on shore by the simple act of pressing buttons, and the utilisation of Robots in place of men, all of which tends to destroy the old art of seamanship, an art rapidly disappearing from among us through lack of encouragement, and the disappearance of that cradle of the seaman's art, the sailing ship. Conrad described the seamen of his day as the everlasting children of the mysterious sea: their successors to-day are undoubtedly the inheritors of a discontented earth.

NOTES ON BOOKS

THE PRINTING OF ETCHINGS AND ENGRAVINGS. By David Strang. With an Introduction by Martin Hardie, R.E. London: Ernest Benn. 10s. 6d.

Since the days of that extremely rare book published in 1583—"A Profitable Boke"—which contained a few paragraphs on etching, nearly every leading practitioner of the craft seems to have contributed a book or article to its bibliography, and to-day almost every month a new book on the subject seems to find its way on to the presses. Most of these are mere repetitions of what has previously been

written. As far as I know, none has as yet been devoted solely to the printing of etchings and engravings until Mr. David Strang has given us this volume, and it seems likely it may be the last on the subject for many a year, so thoroughly has it been treated.

I suppose every educated person to-day is more or less familiar with how an etching or engraving is printed. From reading it seems a simple enough process, but when you have grappled with the job, as I so often have, you will realise it is not as easy as it looks; that success is due to the careful consideration of many apparently trifling things, the daily experience of years, to say nothing of a flair for the work. One may be able to produce an etched plate quite efficiently and, out of a number that are not good, by some fluke print a few good proofs from it. But to print an edition of fifty or a hundred that are equally good, to make the most of an under- or overbitten plate, is only possible to those who can devote the best part of their lifetime to it.

Some artists, who are purists, insist that the etcher should print his own proofs always, and most artists *say* they are disappointed with the proofs a professional printer pulls for them; but I must confess I am always agreeably surprised when they print mine for me. And as to the artist carrying the work all the way through it seems to me ridiculous, for, to be consistent, he should surely hammer out his plate, and make his paper and tools. After all, the colour prints of Japan, which are some of the most skilful and beautiful prints the world has seen, were the product of at least three different hands, the designer, the cutter and the printer. Collaboration in art is not such a difficult thing as some imagine, nor to be despised.

David Strang, who is the son of William Strang, the painter and etcher, and is himself one of the few good professional copperplate printers of to-day, writes in the concise and practical way we should expect (but do not always find) in a text book. There is nothing extraneous. To attain even greater conciseness he has employed a number of symbols and abbreviations which make the explanation of the printing of different types of plate concise and clear.

Without cavilling, I feel sorry Mr. Strang has not thought good to include chapters on printing in colour from intaglio plates. Perhaps he feels, as I do, that most etchings and mezzotints in colour are unsatisfactory—that it is not a medium for colour, but one sees so many badly printed colour etchings in the printsellers' windows that there is surely room for more information and instruction on the subject. A skilful printer like Mr. Strang might do much to improve this phase of his craft.

After a brief outline of the process, we are told how to fit out our printing room, and materials—paper, muslin, blankets and ink—are each given chapters. Four sections are devoted to the plate, its preparation, wiping, printing and care. The author discusses the pros and cons of steelfacing; but, to the printer of etchings and engravings with some experience, by far the most interesting and helpful chapter will be that on the causes of faulty proofs.

This book should certainly do much to help towards the formation of a school of fine copperplate printers, and I hope it will lead to many adopting this as a career, for there are still lamentably few good printers to whom one can entrust one's plates with confidence. Recently, when studying Swedish etching in Sweden, I was amazed at the low standard of printing there, how plates fine in linework and other respects were utterly ruined by bad printing. It would pay a good intaglio printer to settle in Stockholm.

HESKETH HUBBARD, R.O.I., R.B.A.

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No. 4056

FRIDAY, AUGUST 15th, 1930

VOL. LXXVIII

*All Communications for the Society should be addressed to the Secretary, John Street
Adelphi, W.C.2.*

NEWS OF THE WEEK

"It is the man in the street who has my entire sympathy ; and so, too, has the layman who is a lover of art. He searches Europe to satisfy his craving for that disappearing element in art—Beauty—and he finds himself in a seething cauldron. Coming out with this guileless companion from a concert devoted to modern music you each confess to an unholy thirst for a tune : and emerging from a really modern picture gallery, you ask your friend if your hat is 'bashed' in and your tie at the back of your neck."

E. Wyly Grier

Industrial Designs.—The Press has given considerable attention to this year's Competition and it is a hopeful sign of the growing public interest in the importance of Art, applied to all the varying forms of Industry. The standard of these exhibitions will certainly improve every year as the recognition of the aims of the Society increases. The Art Schools are beginning to realise that Art is something more than mere decoration and that form and beauty are applicable to every department of life.

Mr. G. F. Pulman puts the case for the Art Schools in an interesting letter to the *Daily Telegraph* :—

"The main object of art schools, as they are at present constituted, is the teaching of drawing, the use of colour and design, but the practical application by students of the knowledge gained is outside the sphere of the schools.

"In my opinion the various trades themselves should find the money and found art centres for their own specific needs, and continue the training under the supervision of a practical man, one who is conversant with the technical difficulties of manufacture and costs. The art schools should remain places where drawing and designing is taught (always providing the student shows promise) to those who desire it as a means to develop their æsthetic sense."

Surely new life would be given to the Art Schools of England if they developed the æsthetic sense in conjunction with the more practical Industrial side of art. As Professor Lethaby says :—" Drawing is best taught along with apprenticeship to a craft, or otherwise it becomes so generalised that it is difficult for the ordinary student to see its application, and it becomes only a ' subject.' "

Escape from the Dole.—All our political and domestic problems are dwarfed by the menacing growth of unemployment. Mr. Comyns Carr in his important pamphlet works out a constructive plan for the reduction of unemployment. His scheme should claim the serious attention of all parties, whether Protection or Free Trade. The dole is sapping the vitality of all our industries and creating a type of unemployment that is in danger of becoming hereditary.

An Irish Note.—A correspondent writes : " I don't know whether you are acquainted with Ireland or not, but you would go mad over some of the scenery here (Dunmurry), and as yet it is unblemished by advertisements, although the ubiquitous bungalow is popping up, alas, here and there. Why don't the Irish use their natural stone and whitewash and the grey slates which go so perfectly with their romantic scenery."

St. John's College, Battersea.—We visited this place yesterday, and so far nothing has been done. Surely the public are entitled to know what are the plans for the development by the Local Authorities for this beautiful site. It would be a crime if this oasis in the dreary purlieus of Battersea has its beautiful walls and trees destroyed before an opportunity has been given for someone to prove that all its amenities and the beautiful Principal's house can be preserved without sacrificing any of its housing possibilities. Mr. A. G. Prichard, the Mayor of Battersea, in a letter published in *The Times* on August 12th, says : " I do not propose to enter into any public discussion as to the reasons which prompted all parties on the Battersea Borough Council to come to the decision they did in this matter." The Council has a heavy responsibility if they refuse to avail themselves of the opportunity to give Battersea what it needs in the way of Housing without destroying its present and future amenities.

NOTICES

HISTORY OF THE ROYAL SOCIETY OF ARTS

Further copies of the History of the Royal Society of Arts by the late Sir Henry Trueman Wood, the existing supply of which was recently exhausted, are now available, and can be obtained, price 15s. net, on application to the Secretary. The History, a large octavo volume of 558 pages with a large number of illustrations, gives a well documented account of the many and various activities of the Society from its foundation in 1754 to the year 1880.

COMPETITION OF INDUSTRIAL DESIGNS

A selection of the Designs received in the above Competition for Prizes and Scholarships offered by the Society and well-known manufacturers is being exhibited, by kind permission of the Board of Governors, in the Exhibition Pavilion of the Imperial Institute, South Kensington, from the 2nd of August to the 31st August, both inclusive, every weekday from 10 a.m. to 5 p.m., and on Sundays from 2.30 to 6 p.m.

The Exhibition is open free of charge ; no tickets are required. It includes Designs for Architectural Decoration, Textiles, Furniture, Printing and Book Production, Pottery and Glass, and for Posters, Showcards, etc.

Several important firms have expressed a wish to offer Prizes for Designs in connexion with the 1931 Competition.

A Bureau of Information has been established at the Royal Society of Arts in connexion with the Competition, for the registration of the names and addresses of exhibitors who desire to obtain employment as designers. These lists are at the service of manufacturers in search of designers.

A report on the competition, including full lists of awards, will be issued at a later date.

REPRINT OF CANTOR LECTURES

The three Cantor Lectures on "Wind Instruments from Musical and Scientific Aspects," by Dr. E. G. Richardson, Ph.D., D.Sc., Lecturer at University College, London, have now been reprinted in pamphlet form (price 2s. 6d.), and can be obtained from the Secretary, Royal Society of Arts, John Street, Adelphi, W.C.2.

A complete list of Cantor, Howard and other lectures, which are available in pamphlet form, can be had on application.

PROCEEDINGS OF THE SOCIETY

CANTOR LECTURES

RECENT IMPROVEMENTS IN METHODS OF BRICKMAKING

By ALFRED B. SEARLE

*Consultant on Clayworking Problems*LECTURE I.—*Delivered February 17th, 1930*

Precisely twenty years ago, when I first had the honour of delivering a series of lectures before the members of the Royal Society of Arts on "Modern Methods of Brickmaking," I pointed out that in the preceding thirty years enormous developments had taken place in the manufacture of bricks. In the intervening twenty years still further developments have occurred and whilst most of them are not of so revolutionary a nature, they are of great technical and industrial importance as well as of considerable intrinsic interest.

So many changes have occurred during the past twenty years that it is somewhat surprising to those unacquainted with the technicalities of the subject that bricks still remain the most popular as well as the most pleasing of artificial building materials. During, and shortly after, the Great War, many ingenious attempts were made to use substitutes of various kinds for bricks and for a short time great interest was taken in these novelties. With two exceptions they are now seldom noticed, and out of the medley of suggestions and "inventions" of 1916-1925 only bricks, hollow blocks—sometimes known as cavity bricks—and concrete in various forms remain.

The erroneous idea, prevalent for several years, that houses could be built of concrete more cheaply than of bricks, has now almost disappeared, and with an increasing demand for beauty in the colour as well as in the form of modern houses the use of bricks has correspondingly increased. It may appear incredible, yet it is, nevertheless, a fact that, even in large quantities, houses can be built more cheaply of bricks—with all the processes involved in brick manufacture—than with concrete, and the brick houses are far more comfortable.

Many attempts have also been made to use bricks of sizes and shapes different from those in general use, but, with few exceptions, the newer ideas in this connection are seldom employed, and the standard brick, measuring 9in. by 4½in. by 2½in., is still the most largely employed, though many economically-minded builders in the Midlands and North prefer bricks 3in. thick and ignore their lesser beauty in order to obtain a slight saving in bricklaying.

Modern conditions involve vastly larger quantities of bricks, produced at a speed undreamed of a hundred years ago, and make the older methods of manufacture impracticable except for a limited number of buildings in which the additional cost is of minor importance. A result of the ever-increasing demand for

beautiful bricks, as distinct from the uniformly-coloured ones or the cheap "clots" of pre-war days, has been the production of bricks with a rustic surface which, at a little distance, give a pleasing effect, though very different from the hand-made multi-coloured bricks made by old-fashioned methods in small, country brickyards.

For interior work and generally for structures in which the surface is covered with plaster, stucco or rough-cast, so that the appearance of the bricks is of minor importance, modern methods have gone far to produce cheap bricks of much greater strength than those made many years ago.

STOCK BRICKS

The most popular brick in Greater London is the *stock brick*, the manufacture of which has a very long history. About 250 millions of these bricks are used in London every year, a large proportion of them being made in Essex, Kent and Middlesex. Such stock bricks are moulded by hand from a complex mixture, and cannot be made cheaply without sacrificing some of their valuable properties, but enterprising brick manufacturers are using new methods and different kinds of machinery which, it is hoped, will preserve all the desirable characteristics of the bricks, yet reduce greatly the cost of production.

It is too soon to form an accurate opinion of the success of these new methods, as applied to stock bricks, but so far as can be seen they are almost certain to be successful. They vary in detail in different works, but consist essentially in avoiding the old, time-absorbing process of washing, as far as practicable, or if they use it they make it into a more mechanical process than formerly. The paste is prepared by more powerful crushing and mixing machinery, and the bricks are shaped either by the wire-cut process or in machines which imitate the old process of moulding by hand.

The old method of burning in clamps is being replaced by the use of kilns, much ingenuity being employed in reproducing, as far as possible, the same conditions as in the clamps. That is to say, a large proportion of the fuel is mixed (as a fine powder) with the material of which the bricks are made, so that only a small proportion of fuel is needed to keep the kiln at work. One firm has made a success of an ingenious modification of the tunnel kiln.

The large scale on which stock bricks are being made by the newer methods is shown by the fact that in one yard at Sittingbourne one machine produces 10,000 bricks an hour, and with a double shift, which is contemplated when the dryers and kilns are completed, 40-50 million stock bricks will be produced yearly by this one machine.

HAND-MOULDED BRICKS

Where a beautiful appearance is the first consideration, hand-moulded bricks made from certain brick earths and surface loams are always preferred, for by no other process can such charming colour-effects be obtained. For this reason, many of the old-fashioned methods of brickmaking are still in use. The improvements recently made in them are confined almost entirely to the greater use of

crushing rolls and the substitution of power-driven machinery for the old horse-driven pug-mill.

The advantages gained by the use of power-driven machinery for preparing the clay paste are (i) That the product is much more uniformly moistened and so is more homogeneous ; (ii) Several clays which could not be used if prepared in horse-driven machinery can be employed satisfactorily if power-driven machines are used, as their action is more intense and, therefore, more thorough. Harder materials can be effectively crushed and the various particles more completely surrounded by water ; (iii) A larger output can be obtained with the same number of men employed and in some cases fewer men are needed.

The power-driven machines now used consist chiefly of one or more pairs of crushing rolls, according to the nature of the brick-earth, and a pug-mill which mixes the crushed earth with water and forms a plastic paste of good working consistency. The amount of water to be added must be regulated by hand ; sometimes the earth is so moist that no additional water is needed, but in a dry season as much as 200 gallons of water may be required for each thousand bricks.

Complete uniformity of texture is not desirable so long as the water is uniformly distributed ; indeed the presence of particles of various sizes adds to the quality of the bricks. What is essential is that the material, when shaped, shall shrink uniformly as, otherwise, distortion and cracking may occur.

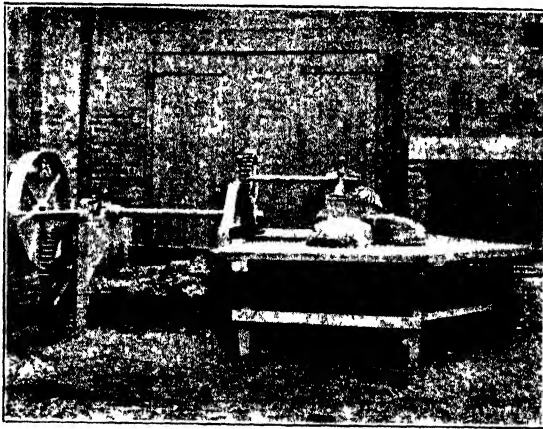


FIG 1.—Vulcan Pugmill

(By courtesy of H. & E. Lintott, Horsham)

A typical pug-mill of modern type is shown in Fig. 1. This is made by H. and E. Lintott, of Horsham, and not only mixes the clay and produces a uniform paste, but delivers it on to the moulder's bench, convenient for his use. Such a machine saves the cost of carrying the pugged clay from the machine to the moulders. Pug-mills of other patterns are made by the leading makers of clayworking machinery, but need not be described in detail.

EXCAVATING MACHINERY

The use of excavating machinery instead of human labour for digging the clay is generally considered to be applicable only to large works and, even then, only to those where the brick earth is sufficiently uniform to require little or no selection. It has been found, however, that with a production of 1,500-2,000 bricks per hour it is economical, with a suitable material, to use a small petrol-driven excavator of the bucket-elevator type with a petrol consumption of two gallons per day. The excavator runs on an ordinary 20-in. or 24-in. gauge tramway and moves automatically along the track, taking with it the truck it is loading.



FIG. 2.—Pigmy Excavator.

(By courtesy of G. Descamps, Sheffield.)

One of these Pigmy Excavators (Fig. 2), with one man to work it, will dig as much as eight men. It must not be used in unsuitable material or it will cause serious trouble. In larger works, correspondingly larger excavators are used, those on "caterpillars" being highly advantageous.

SCOOPS AND TRACTORS

In some localities, a scoop drawn by a Fordson tractor is an excellent method of getting the brick-earth, especially if it is first loosened by a harrow consisting of a series of cutting discs which can be drawn by a similar tractor. Such an arrangement enables the clay to be harrowed, weathered, and gathered under very favourable conditions, both as regards capital and running costs, but it is only applicable to strata of uniform composition and fair depth.

MOULDING MACHINES

The use of mechanically-operated moulding machines in place of the hand-moulds formerly used, is by no means new, but larger numbers are now employed.

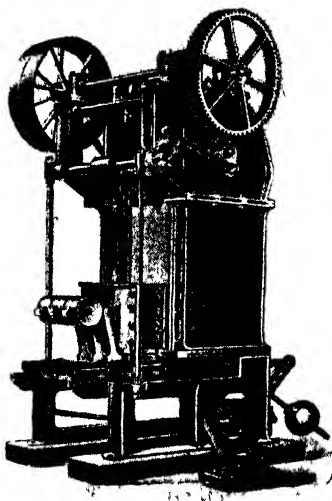


FIG. 3.—Norris Brick Machine.

(By courtesy of The Brightside Foundry and Engineering Co., Ltd., Sheffield.)

One of the best known of these machines—the “ Norris ” (Fig. 3)—makes three bricks at a time, this number having been found to be more economical than making five or six bricks at once.

The remainder of the process of making hand-moulded bricks has not greatly changed during recent years, nor is it likely to do so, for the charm of the bricks is largely due to the variations in colour and texture due to the manner in which the bricks are made. Any mechanical devices which did away with these variations would merely spoil the bricks !

THE WIRE-CUT PROCESS

The earliest form of this process is about fifty-five years old, so that it is far from new, but many improvements have been made since it was first invented.

The essential machine is a device which will force the prepared clay-paste through a mouthpiece or die having an opening about 10 in. by 5 in., i.e., the size of the brick in its moist state. Several means for forcing the paste through the die are available, but a continuous action is by far the best ; the arrangement now adopted consists of a series of blades or knives arranged on a horizontal shaft inside a horizontal cylinder. The blades are placed at such an angle that when they and the shaft rotate they force the clay-paste forward, compressing it slightly as it passes through the mouthpiece and is extruded in the form of a column or

band of clay 1oin. wide and 5in. deep. A dextrous youth, provided with a vertical wire fitted in a suitable frame, can cut off a piece of any desired length from this column and without stopping the machine can pass the cut-off portion on to a cutting table where other wires cut it into bricks, whence the term "wire-cut bricks."

In some American brickworks, the plastic clay is first cut into flakes or shreds instead of being passed through crushing rolls, as is customary in this country.

AUGER MACHINES

The modern idea is to regard the "wire-cut" brick-machine as a shaping device which must be supplied with suitable paste, and not as a machine which can be fed with crude clay. Consequently, it is desirable to give the machine a separate name to distinguish it and it is now known as an *auger-machine* (Fig. 4).

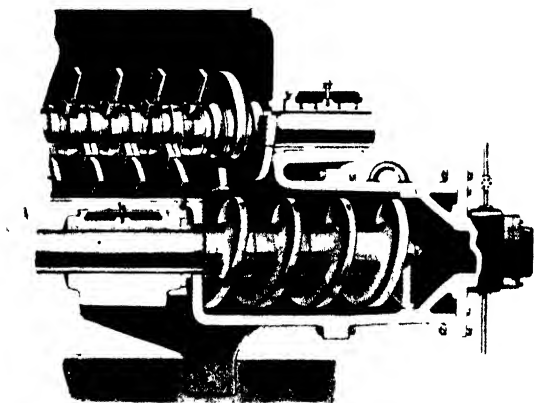


FIG. 4.—Interior view of Auger Machine.

In such a machine, the prepared paste is forced forward and compressed as it passes through the mouthpiece, the shape and size of the blades being designed so as to give a maximum propulsion with the minimum expenditure of power. An auger-machine has no mixing power and must, therefore, be provided with properly-prepared clay-paste. With such a material, the only limit to the speed at which it can be extruded is that imposed by the shape, size, and pitch of the blades, and the design of the mouthpiece.

Most of the English machines used for making wire-cut bricks combine the action of a pug-mill (or mixer) with that of an auger-machine (or shaper) and, consequently, are not as efficient in either function as if two separate machines were used. Fortunately for many of the materials used for making wire-cut bricks, such machines are adequate when an output of 2,000 bricks (or less) per hour is sufficient, but for larger outputs and for materials which are difficult to manipulate separate machines are preferable.

In some English brickworks it has long been the practice to insert an open trough-mixer between the crushing machinery and the brickmaking machine. This largely overcomes one of the chief difficulties experienced in the manufacture of wire-cut bricks, viz., cracking and lamination of the clay-column. Where a very large output is desired, however, a longer "auger" than can be placed in an ordinary brick-machine is required and, therefore, a separate auger-machine must be used.

Details, such as the dimensions of the "auger," the pitch of its blades, and the distance between them should all be regulated by the nature of the particular material of which the bricks are to be made and so cannot be considered here.

As the mouthpiece has a serious retarding effect, nothing is gained by using too large an auger, or by driving it at an excessive speed. Moreover, the importance of having a thoroughly homogeneous material must never be overlooked, so that there is always a tendency to use a short auger and provide any surplus part of the shaft with mixing blades. In some cases, the auger is so short that it does not form a single complete "turn" of a screw-thread, yet it has sufficient propulsive power to produce the desired output. The possibility of using incomplete augers explains the extensive use of wing-knives and other fittings which are intermediate between a plain blade and a complete screw.

MOUTHPIECES

Improvements in the mouthpieces or dies of wire-cut machines have not been either numerous or important during the last twenty years. A well-prepared clay-paste can be shaped by the simplest of mouthpieces if the auger or equivalent propulsive device is of a suitable design. Hence, the over-elaboration of mouthpieces tends to cause trouble rather than otherwise, and the present trend is towards the use of the simplest forms of mouthpiece.

It has been a common mistake for many years to use mouthpieces which are too short and, consequently, tend to alter the shape of the clay-paste too rapidly. This results in the production of "dogs' teeth" or lamination in the clay-column. By using a mouthpiece of sufficient length and one which is effectively lubricated, these defects are avoided.

When the clay issuing from a wire-cut brick-machine is *hot*, something is wrong with the machine. The commonest cause of high temperature is the clay working backwards through the machine, because the blades are either too small or have not sufficient propelling power. If the brick-machine is much too large for the output of the mouthpiece, the defect may be very serious. Recent investigations have shown that to reduce the friction which causes the overheating and so leads to other defects, the most satisfactory means are :

1. Prompt renewal of the worn blades so that there is not more than $\frac{1}{2}$ in. space between the edge of the blades and the lining of the barrel.
2. Correct regulation of the water and clay.
3. The use of a well-designed mouthpiece.

4. The use of a brick-machine of suitable diameter.
5. Better lubrication of the machine and protection of the bearings from the entry of clay, etc.

With some clays the wear and tear on the mouthpiece is very serious, as the frequent replacement of this device is expensive. This has been investigated recently¹ and it has been found that, in a given time, the loss of metal in a mouthpiece made of cast iron is ten times the loss with a mouthpiece made of chrome steel.

The most efficient method of lubrication is by water, which is applied under a slight pressure (seldom more than 10 lb. per sq. in. and usually much less).

The use of compressed air at a pressure of 60 lb. per sq. in.—the pressure required depending on the clay—has proved very satisfactory in some works. It avoids the use of steam, which involves a boiler and is cheaper than oil or other purchased lubricant. With some clays, however, steam is far more effective than air, and other clays seem to require oil or water as a lubricant.

CUTTING TABLES

Twenty years ago, the clay column was almost invariably cut by pushing it against a series of vertical wires stretched taut on a fixed frame, and this method is still used in most brickworks. For many years, Continental manufacturers have realised the disadvantages of this device and have employed others which have not met with a good reception in this country. More recently, however, the replacement of hand-operated cutters by automatic ones has received a considerable amount of attention and several automatic cutters are now in use in this country.

When a hand-operated cutting device is used, irregularities in the speed at which the clay-column is produced are of minor importance, as the man in charge waits until a sufficiently long column has been produced before he attempts to cut it. With an automatic cutter, on the contrary, the column must be produced at a perfectly regular rate or else the cutting device must be accurately synchronised—a very difficult matter. Any failure in regularity will cause bricks of undesirable size to be produced, and the cost of sorting and the loss involved may be serious. An accurate automatic cutter is highly advantageous; it saves part of the labour of a man, it avoids the production of waste-ends, and without any alteration in the brick-machine it increases the output by at least ten per cent., simply as a result of the saving of time and material which it effects. Automatic cutters are likely to be used more extensively in the future; at present they are capable of improvement in several directions and are regarded by many brick manufacturers as still in the development stage. The two fully automatic cutters which are best known in this country are both made abroad: one type is supplied by Thos. Linstrum, of Leeds, and the other by M. Steenbrugge & Co., of London.

¹ J. Franklin Inst., 208, 555 (1929).

METHODS OF DRYING

Bricks made of plastic clay contain 15-25 per cent. of water, which has to be removed before the bricks can safely be burned in a kiln. The drying of the bricks is, therefore, an important part of their manufacture. In many brickyards, particularly in the South of England, the bricks are still dried in the open air, in long rows known as *hacks*, but in the more modern yards, which work all the year round, the bricks are dried by artificial heat.

In works producing about five million bricks a year, hot floors—heated by steam or coke fires—are still largely used. They are moderately costly to build, easy to use, have great flexibility as regards the rate of drying, and several minor advantages, but they are slow and irregular and involve a considerable cost in handling the bricks and in taking them to the dryer and from thence to the kiln, as each brick has to be laid separately on the floor and separately picked up again.

The ventilation of many drying sheds is very inefficient, chiefly because the builders have not sufficient knowledge of the subject. The ordinary jack-roof or lantern-ventilator with louvres is of little value, because it only operates to advantage when there is either no wind at all or when the wind is parallel to the ridge of the roof. At all other times the ventilation is hampered by the wind. To overcome this, properly-designed ventilators should be installed. One of the best of these

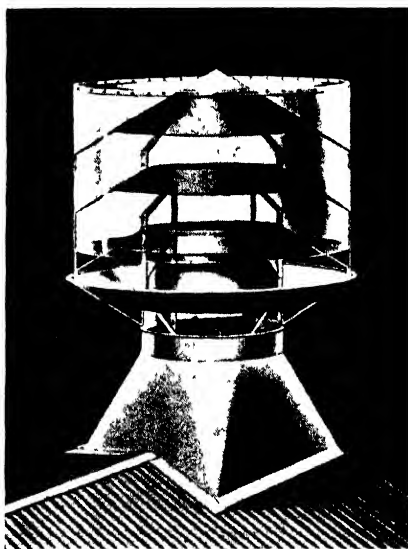


FIG. 5.—Robertson Ventilator.

(By courtesy of The Wolverhampton Corrugated Iron Co., Ltd., Ellesmere Port, Cheshire.)

is the Robertson Ventilator (Fig. 5), because in it the drawing power of a simple shaft is multiplied six times and provision is made against storm and down-draught. The wind can blow in any direction and yet the same ventilation is produced in

the dryer. The inefficiency of the ordinary "jack" or "lantern" roof, which is so largely used on hot-floor dryers, can be readily demonstrated.

As efficient ventilation is one of the essentials in good drying, the use of suitable ventilators is always worth very careful consideration.

Corridor dryers are by no means new, but for many years their obvious advantages were not appreciated in this country, so that, as far as British brick manufacturers are concerned, this kind of dryer may be included among "recent improvements in brickmaking."

The Keller dryer² is the best known of the corridor type. It consists of a series of long chambers, each of which is worked independently of the others, thereby giving great flexibility in operation. Each chamber may be regarded as a cupboard, with portable shelves consisting of loose boards³ or pallets, on which the bricks are placed side by side. The bricks on these boards are taken to the dryer on a very ingenious car, which is the chief feature of the dryer and the main secret of its success.

When the bricks in a chamber are dry, they are removed by means of a similar car and taken direct to the kiln, where this is feasible, or to a "mangle," which is a temporary holder, enabling the car to be unloaded instantly, and the bricks transferred to shorter cars on which they can enter the kiln.

The corridor dryer, worked in conjunction with the Keller car, has a very low cost for labour and installation and this counterbalances the slightly greater cost in heating as compared with some other dryers.

A *Tunnel dryer* consists essentially of a long, low structure which encloses a series of cars or wagons, each carrying a convenient number of bricks. The heat required to dry the bricks may be supplied in the form of (a) steam; (b) hot air, heated in any convenient manner, and (c) waste gases from the kiln or kilns. Whichever source of heat is used, the bricks are dried by the air in the dryer, the temperature being regulated so that the bricks are not damaged. In some dryers, the humidity as well as the temperature of the atmosphere inside the dryer is carefully regulated, and when this is skilfully done, the best results, both in speed and quality, can be obtained.

It is not necessary here to go into the details as to what are the best conditions of temperature and humidity, as these have to be found experimentally in each brickworks, unless the owner is content with something short of the best, but a very brief description of the various types of tunnel dryers may be interesting.

In one form of tunnel dryer, each chamber is filled with cars carrying bricks and is slowly heated until the bricks are dry. It is then allowed to cool and the bricks are removed and taken to the kiln. This form of dryer can be very wasteful in time and heat, but it is capable of very thorough control and, consequently, its

²Supplied by M. Steenbrugge & Co, London.

³ Pallets made of pressed metal, perforated and lacquered, are more durable than those made of wood and have the further advantage that they are not so easily damaged by heat and do not "catch fire."

apparent disadvantages are more than counterbalanced in other ways. By controlling the temperature and humidity of the air in the dryer, the bricks may be dried very rapidly and much time saved thereby, so that the loss of time occupied in cooling is not serious. If a batch of bricks is more damp than usual, this type of dryer is flexible enough to deal with them, whereas most other types would allow them to be taken to the kiln before they were sufficiently dry. By using an efficient means for circulating the air in the dryer, the amount of heat required is much less than in some other dryers and a further saving is effected.

One of the best-known dryers of this type is the one built by the Carrier Engineering Co., Ltd., London (Fig. 6); in this, the bricks are stacked on cars or shelves and remain stationary throughout the drying. They are heated first by a current of air, saturated with moisture and circulated through the dryer. When the bricks are at a suitable temperature, part of the saturated air is replaced mechanically by unsaturated air at the same temperature, with the result that drying commences and is continued under perfectly safe conditions at the maximum rate the bricks will stand.

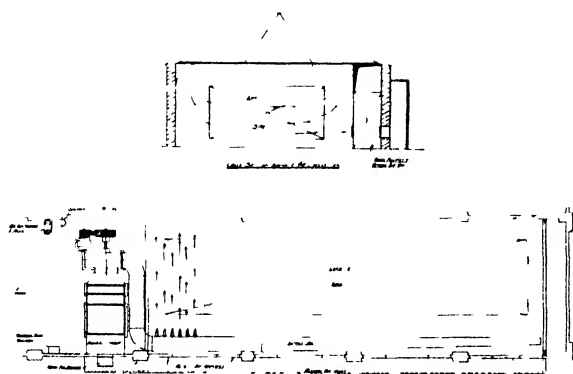


FIG. 6.—Plan and Sectional Elevation of Carrier Dryer.
(By courtesy of the Carrier Engineering Co., Ltd., London.)

The Carrier Dryer (Fig. 6) is usually of the chamber type, but in the United States the automatic humidity and temperature controlling device, which is the chief feature of the Carrier dryers, has been applied to tunnel dryers with great success. The tunnel is divided transversely into four sections, each of which is maintained at a different degree of humidity and temperature; the cars loaded with bricks or other goods remain in one section for a prearranged time and then pass in turn through the following sections and out to the kilns. An exceptionally good circulation of the air is obtained in each section, and in one works the loss in drying has been reduced from 8 per cent. to $\frac{1}{4}$ per cent., mainly as a result of using the (patented) automatic controller of humidity and temperature.

The chief feature of the Carrier system is that both the humidity and temperature are controlled automatically and far more accurately than with ordinary hand-control.

The chief improvements in tunnel dryers in recent years may be briefly summarised as follows:—

1. Better control of the humidity and temperature of the atmosphere inside the dryer.
2. Better control of the movement of the air in the dryer, chiefly by the use of fans.
3. Minor improvements in the dimensions and construction of dryers, whereby better use is made of the heat admitted and less heat is lost by radiation.

These improvements are largely the result of a better knowledge of what occurs when bricks are dried and of a recognition of the fact that drying is effected with the greatest speed and safety if the bricks are first heated to a high temperature under conditions where no drying can occur and the atmosphere surrounding them is then gradually changed, the temperature being kept constant or slightly increased, until all the moisture is removed. This procedure is entirely different from that in general use twenty years and more ago, when a very large volume of air at a low temperature was used in the first stages of drying, the temperature being gradually increased as the bricks dried. In some of the most modern dryers, the bricks are raised rapidly to almost the maximum temperature, drying being prevented by keeping the atmosphere saturated with moisture. When the bricks have attained the requisite temperature, this saturated atmosphere is gradually replaced by drier air at the same temperature, and so the moisture is removed from the bricks without any risk of cracking. The humidity of the atmosphere in the dryer can be varied automatically or by hand-control, as may be desired.

Some recent experiments by Geiger¹ have shown that by heating the bricks with saturated steam at a temperature of 340 degs. F. and, after a suitable time, replacing the steam pressure by a vacuum instead of by a current of air, very rapid, yet safe, drying can be secured. On a semi-commercial scale, bricks have been dried satisfactorily in this manner in 45 minutes! This method has not yet been used in the regular course of brick manufacture.

WASTE HEAT FROM KILNS

The use of waste heat from kilns for drying bricks has received much attention in recent years. Briefly, it consists in either (i) passing the gases from the kiln among the bricks in the dryer—a crude method—or beneath the dryer floor, or (ii) drawing air through the cooling kiln and passing it among the goods to be dried. In both cases, a fan is used to move the air or gases and the cost of running this fan must not be overlooked.

¹ *Ceramic Age*, 176 (1929).

A well-designed continuous kiln has so little available waste heat that it does not pay to transfer it by pipes to a dryer, but if a continuous kiln is badly designed, the use of the waste heat may be advantageous. In most cases, however, it is better to alter the kiln so as to avoid producing much waste heat. Only under exceptional conditions can all the bricks be dried by waste heat so that the complications made by its use in the routine of manufacture often render its employment undesirable.

BURNING PLASTIC BRICKS

Bricks made by hand-moulding are almost invariably burned in intermittent down-draught kilns of a type which has been in use for several centuries. The few improvements which have been made in such kilns are so entirely matters of detail as scarcely to need mention. There is, however, one exception which is of great interest, namely, the means now used to reduce the loss of heat by radiation. It has been found that by building a course of highly porous bricks below the floor of a down-draught kiln, and by using similar bricks in the side walls and crown, a considerable saving in fuel is effected, because the highly porous bricks act as heat-insulators and prevent the escape of much heat that would, otherwise, be lost. The best practical results are obtained by using 9in. of firebrick backed by 9in. of insulating bricks, but where this is impracticable, a very great saving in heat can be effected by using only 4½in. of insulating bricks. The most suitable material for these bricks is kieselguhr or diatomaceous earth, the individual particles of which are hollow, cellular structures with extremely thin walls. The fear that the cooling of the kilns would be unduly prolonged is not realised in practice, because less heat is retained in the insulated walls.

Several improvements in working down-draught kilns have been made in recent years, particularly in the manufacture of firebricks. They consist chiefly in applying a fan or accelerator to increase the draught during the early part of the firing, when ordinarily it is at a minimum, and in using recuperators to supply hot secondary air for the combustion of the fuel. By this means, the slow, first stage in the burning can be reduced from a week to two days.

None of these improvements can be regarded as intrinsically "new," but their application in an increasing number of works justifies their being mentioned here.

There is an increasing tendency to burn hand-moulded bricks in continuous kilns, though this involves many difficulties if the beautiful variations in colour are to be maintained. Some manufacturers have been very successful in this direction—chiefly as a result of careful attention to the firing and only to a minor extent by any structural alterations to the kilns.

Wire-cut bricks are almost invariably burned in continuous kilns, but as these kilns are also used for bricks made by other methods, a consideration of them is deferred to the second lecture.

TRANSPORT WITHIN THE WORKS

When one considers the enormous weight of material which is handled daily in a brickworks—it has been found to be about 12 tons per 1,000 bricks, or nearly four times the weight of the bricks themselves, owing to the number of times the material is moved—it is easy to see that any method which will reduce the cost of handling is of very great importance.

One of the chief difficulties of using many modern types of conveyor is the constantly moving delivery- or reception-ends, because the clay-face recedes as it is worked, and if a continuous kiln is used, the green bricks must be supplied to a different chamber each day, and the burned bricks must be taken from a different chamber daily.

Roller conveyors worked by gravity are good, but too costly and of limited usefulness. Tramways do not enter the kiln readily, and deliver the bricks at too low a level. In the works, too, tramways "pick up the dirt" and are far from attractive, either as regards appearance or the labour of pushing them. A mono-rail, on the contrary, is well above ground level, it picks up no dirt, the body is at a better level for pushing, and the labour of moving it is far less than with a wheelbarrow or tramway. It will bring clay to the machines, though where the distance is great a rope haulage may be preferable, but nothing at present available is superior to a mono-rail for taking bricks from the machine into the dryers, holding them whilst in the dryers, and then taking them to the kiln. In works where hand-made bricks are produced there is no device which will so conveniently deliver the clay-paste from the pug-mill to any number of moulders with less mess and inconvenience.

Unfortunately, neither a mono-rail nor any other mechanical appliance yet devised will satisfactorily take the bricks from the machines or dryers direct into the kilns and deliver them to the setters, but a roller or gravity conveyor will take them from a mono-rail at the wicket with a minimum of labour.

The runways may have a single bucket or platform,⁵ or two or more trays one above another⁶; the latter has the carriers fastened to an endless chain, thus forming a continuously-moving conveyor.

Another useful form of conveyor consists of two endless cables running parallel to each other. Boards containing six or eight bricks can be carried by this means from the machines to the dryers or from the dryers to the kilns.

RUSTIC BRICKS

The demand of twenty years ago was chiefly for smooth bricks of uniform colour and great accuracy of shape and this was satisfied by the production in very large numbers of bricks of the Ruabon, Accrington, and Southwater type, though bricks of the same type, yet with marked differences, were made in various

⁵ Supplied by Geo. W. King, Ltd., Hitchin, Herts.

⁶ Supplied by The Pragos Engineering Co., Ltd., London.

parts of the country. During the War and since, there has been a rapidly increasing demand for bricks of a rougher texture, with "broken colours" and varied tones.



FIG. 7.—Rustic Bricks.

(By courtesy of Mr. C. W. Maskery, Chester.)

The rough surface of many of the so-called "rustic" or "tapestry" bricks (Fig. 7) is produced by stretching a wire across the opening in the mouthpiece of a wire-cut brick-machine, the wire being so placed that it cuts off a very thin slice of clay from the column, much as a cheesemonger slices a cheese. The wire cuts and "drags" the material and sometimes is separated from it, with the result that an irregular rough surface is produced. When a single brick of this type is examined its appearance may be far from pleasing, but when viewed in a wall, with suitable joints, the general effect is pleasing to many people and such bricks are very popular.

If two wires twisted together are used instead of a single one, the effect is still more pleasing, and by altering the depth of cut and the coarseness of the clay, sufficient variations can be obtained to produce generally pleasing effects, even on large wall-surfaces.

Instead of a wire, the plain column of clay may be cut and "scrubbed" with a brush having "bristles" made of copper or brass, before it enters the cutting table. The "ends" of the bricks are scrubbed separately and are then "clapped" with a wooden board.

Another method used for producing a similar effect consists in engraving on a steel plate a series of depressions corresponding, for example, to the bark of a larch tree, and inserting the plate in a press which is then used for the final shaping of the bricks. Any design which does not involve "undercutting" can be used and a great variety of pleasing effects obtained.

Sometimes an apparently crude effect, which would scarcely be tolerated in a single brick, viewed alone, is sufficiently pleasing to become popular in some localities.

The appearance of rustic bricks depends quite as much on their variegated colouring as on the texture of their surface. This will be considered in the next lecture in connection with "multi-coloured bricks."

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No 4057

FRIDAY, AUGUST 22nd, 1930

VOL. LXXVIII

*All Communications for the Society should be addressed to the Secretary, John Street,
Adelphi W.C.2.*

NEWS OF THE WEEK

"For my part, I think, content and health are the only jewels; and believe that a man who works without question and can idle without boredom, is better off than a man to whom work is a drab necessity and idleness an emptiness to be filled at any cost.

"The countryman may be, by L.C.C. standards, 'unintelligent,' yet has in his quiet mind treasures of practical and placid wisdom which, though they can never be broadcast, are more than equal in life's value to the fretful, changeable, nervous, and too often ephemeral thoughts which swarm in the over-stimulated townsman's mind."

Frank Kendon.

Vanishing Treasures.—*The Daily Telegraph* has a leader under this heading. We wonder if it is quite correct to make the American responsible for the various depredations which they recite in this article. We understood that the ancient thatched smithy at Cockington had been purchased for local preservation. The comparatively small sum which would be necessary to preserve this should have been forthcoming locally if the authorities realised the historic value of such a place. Cockington is, or was, one of the loveliest of the Devonshire villages. It would be interesting to know who has bought the Great Chamber of Gilling Castle. We doubt if the Americans have yet seen it. In regard to the

Bradenstoke barn, this was a great asset to the district and should never have been moved. It stood in disrepair long enough for any Englishman to come to its rescue, but we understand that, although not intact, its parts are still in this country. It is certainly news that any American ever made so ridiculous a suggestion as to remove the whole village of Bibury, even if it were possible. We do recall, however, that when the late Sir Lawrence Weaver went to America to lecture on domestic architecture in this country, he was asked by the Royal Society of Arts to see if he could collect funds for their preservation work. He came back and informed this Society that the American was diffident about contributing, but that if he came back again in the following year with a concrete proposal for the preservation of something definite, such as an English village, they thought that he would have considerable success. Unfortunately, he never lived to go back again. But the suggestion materialised in the Society's purchase of the Village of West Wycombe.

Country Inns.—Mr. Powys, of the Society for the Protection of Ancient Buildings, writes a very interesting letter to *The Times* criticising the restoration of an old inn at Salisbury. It is a pity that advantage was not taken of the direction by his Society of this particular piece of work. It needs considerable experience in dealing with these old buildings if their character is to be preserved. We recall many instances of rebuilding of inns, professedly on the old lines, but which have resulted in a complete loss of the charm associated with them. It is quite impossible to fake up old materials to fit the requirements of the modern public-house with any success. We recall especially an attractive old inn which is being rebuilt with a wealth of half timber work and moulded chimneys. The result is distressing in its self-consciousness. It would have been far better to have quite frankly built a modern inn than to attempt to get the picturesqueness of the old out of the increased heights demanded by the construction of the modern brewers.

Agriculture.—In view of the enormous circulation of *The News of the World* in country villages, it is interesting to read the following in this week's issue :—

"It will come as a revelation to the "Dismal Jimmy" pessimists to learn that agriculture, the age-old mother of every industry, is by no means 'down and out' in this country.

"On the contrary, British agriculture was never more potentially prosperous than it is to-day. There are splendid new openings in many directions, and up-to-date farmers face the future full of hope and confidence. British farming is far removed from the effete or dying industry our calamity howlers make it out to be.

"It has boundless assets. According to the latest official returns, we have

30,672,000 acres of agricultural land in England and Wales, without reckoning anything less than one acre in a holding. The value of this land, with the buildings on it, is quite £800,000,000, compared with £74,000,000 invested in cotton. In addition, we have fully £360,000,000 working capital employed in agriculture."

In connection with this it is interesting to read that "When the Society of Arts first included agriculture among its objects, but little real advance had been made on mediaeval methods. Yet new ideas were in the air, and as far back as the very beginning of the eighteenth century the commencement of the change can be discerned which was soon to abolish the old order of things, and to modify in the course of a comparatively short period the ancient system that had sufficed for so many generations. The time was favourable for improvement, and some central authority was badly needed to co-ordinate and direct the scattered efforts which were being made in England, Scotland and Ireland to bring about an improved system of husbandry."

Derby Assembly Rooms.—What possible reason can there be for the destruction of this beautiful building? The Corporation of Derby has obtained powers for compulsory purchase (we are told) and intend to clear the site for the erection of a new Town Hall. Derby is surely not so rich in architectural values that it can afford to lose this building. If it is absolutely necessary to have a new Town Hall, surely these Assembly Rooms could be made part of the scheme. Even on the grounds of economy, surely in these days of protesting ratepayers there is every argument for its retention. We appeal to the Architectural Association to come to the rescue of a building the value of which they, at least, understand.

Keats's House, Hampstead.—There has been considerable reference in the papers to what would appear to be a proposal to place a building in the garden of Keats's house to accommodate the Dilke bequest and other objects of interest now occupying a comparatively small area of the Central Library in the Finchley Road. We renewed our acquaintance with Keats's house, and found that it was much more than a proposal and that the site was being cleared for the building. In an interview with the Mayor of Hampstead, he said that the house stands in extensive grounds of which one corner is occupied by stabling and other outbuildings in the last stages of decay. He says the scheme *proposes* to do away with these. But they *are* done away with! And the space suggests an extension of the garden rather than a site for any buildings, as the area around the house is comparatively small. We should have thought the money would have been much better spent on putting the existing house in thorough structural repair, and if more space were required of a fireproof nature, this could very well

have been added at relatively small cost by an extension to balance the more modern addition which has already been made on one side of this charming little late Georgian house with a somewhat unbalanced effect. In view of the national interest in this literary shrine, could not the Hampstead Council hold their hand and let the public have an opportunity of seeing the plans without travelling to Hampstead to do so?

Strong opposition to the scheme is expressed by Mrs. Lobban, a sister of Sir Arthur Quiller-Couch, who delivered the inaugural address when Keats' House was handed over to the Council. This lady urges not only that there is ample room in the house as it stands for the display of these particular relics, but that, as Keats's House was bought with money raised by public appeal, and not out of the rates, it might be a breach of their trust to spend the ratepayers' money upon the proposed new museum.

PROCEEDINGS OF THE SOCIETY

CANTOR LECTURES.

RECENT IMPROVEMENTS IN METHODS OF BRICKMAKING.

By ALFRED B. SEARLE,

Consultant on Clayworking Problems.

LECTURE II.—*Delivered February 24th, 1930.*

BRICKS OF SLIGHTLY PLASTIC MATERIALS.

The cost of moving bricks from the works to the building site is so great that most brick manufacturers find it impracticable to deliver outside an area with a radius of about fifty miles from their works. It is, therefore, of great importance that bricks should, as far as possible, be made from local materials and as these may range from a river mud, sandy clay or loam, to an indurated clay, mudstone, or shale with the hardness of "rock," one process cannot be equally suitable for making bricks in all localities.

For the easily-worked loams and plastic clays, the processes described in the previous lecture may usually be employed, though in some cases a more elaborate method of preparing the clay is necessary. When a river-mud, or some other form of clay which is very wet or "sticky," is to be used, it may be necessary

to dry it before converting it into bricks. Hard clays and shales must usually be reduced to powder before they can be made into bricks.

Some portions of the London clay are peculiarly unsuitable for a plastic process, but can be made into excellent bricks if the clay is first dried, then ground to powder and made into a "semi-dry" or "stiff-plastic" material.

Clays which contain stones—such as the Boulder clays—do not produce such good bricks by the wire-cut process as they do when dried, ground to powder, and shaped by the stiff-plastic process. Limestone in a brick clay is particularly objectionable if the pieces are larger than "pinheads," yet it cannot be crushed sufficiently small by the machinery used in the ordinary wire-cut process and it is usually cheaper and better in every way to dry the clay first and then grind it to powder.

When brickyards only made one or two million bricks in a year, it was relatively easy to find sites with an ample supply of uniform material, and to separate stones and other undesirable impurities. On the enormous scale on which bricks are made to-day it is almost impossible to find sufficient quantities of uniform material and a process must, therefore, be used which will make use of many kinds of clay or shale occurring in widely different proportions on one site. In short, to meet present-day demands, all these various materials must be reduced to a uniform mass. If they are lumpy they must be crushed, if they are wet they must be dried or mixed with dry material, and so on.

DRYING RAW CLAYS.

The preliminary drying of some clays is thus seen to be of great importance, yet, whilst this was known twenty years and more ago, it is only during the past twelve or fourteen years that its importance has been appreciated in this country. Before that time, several manufacturers were careful to dry a portion of the clay on the kiln or in a dryer, or in some other makeshift manner, but the practice of drying the whole of the material must be regarded, at any rate as far as most brick manufacturers are concerned, as being so "recent" that only a few of them have adopted it.

Clays may be dried in various ways, but for a large and regular output of bricks the most generally satisfactory arrangement is a rotary dryer. This consists of a large tube or cylinder almost, yet not quite, horizontal, down which the clay travels and is discharged in a dry (or sufficiently dry) state at the lower end. To ensure uniformity of working, the pieces which enter the dryer should not be large, so that a preliminary cutter or shredding machine is sometimes used before the clay enters the dryer. When several materials, or materials from different strata, are to be mixed in prearranged proportions, they may be tipped *ad lib* into a Haendle feeder (fig. 8), or similar device, and taken from this in a bucket-elevator, or similar device, to the dryer. The Haendle feeder has a small cutter which slices large lumps and so prevents them from entering the dryer.

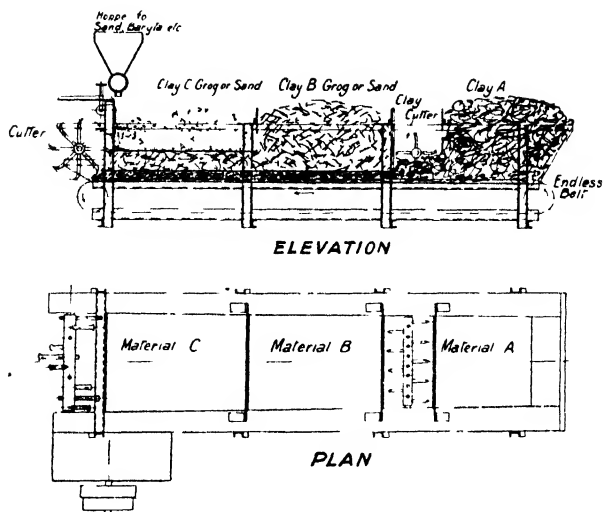


FIG. 8—Plan and Elevation of Haendle Feeder.
(By courtesy of Pragos Engineering Co., Ltd., London)

By a preliminary drying, many clays, which would otherwise be unsuitable, can be made into good bricks.

Complete drying is neither essential nor desirable. For the stiff-plastic process 10-15 per cent. of moisture should be present and for the semi-dry process 6-8 per cent. of moisture; these figures are only approximate.

THE STIFF-PLASTIC PROCESS.

One of the most useful methods for converting mudstones, shales and other indurated or dried clays into bricks is that known as the stiff-plastic process. In its simplest form, it consists in grinding the material to powder and mixing it, if necessary, with just sufficient water to make it of the consistency of moist soil, the particles "balling together" under the pressure of the hand, yet not forming a new shape so readily as a plastic paste. The granular product thus obtained is next shaped by compressing it in any convenient manner and afterwards repressing it in an ordinary power-driven press.

A great advantage of the stiff-plastic and semi-dry processes is that, as they do not require steam for drying the bricks, the plant can be driven electrically, or with gas or crude oil, and a considerable saving effected in the cost of power.

IMPROVEMENTS.

The improvements which have been made in "stiff-plastic" brick machines are mainly matters of detail, important, yet not of sufficient general interest to be described here. Their main result has been to give greater access to various parts of the machine when repairs are needed, to reduce the amount of power

required (chiefly by the use of ball bearings wherever possible), and to increase the durability of the wearing parts.

Apart from this, the chief improvements in plants using the stiff-plastic process are :—

(i) The greatly increased use of mechanical excavators of (a) the “ shovel ” type ⁷ mounted on caterpillar wheels, and (b) the bucket-elevator type.

(ii) The provision of “ feeders ” which ensure a regular supply of material to the grinding mill and so prevent overloading, or of ground material to the brick machine and so ensure a regular output of bricks.

(iii) An automatic device for supplying oil to the interior of the press-boxes so as to avoid the waste of oil which occurs when it is allowed to flow through a tap from an overhead tank.

(iv) A mechanically-operated brush for cleaning the surface of the preliminary moulder is often used and avoids spoiling bricks by the incorporation of waste clay.

(v) An ingenious mechanical device, which enables two represses to be fed alternately, can be fitted to the machines.

(vi) Several devices for increasing the output and effectiveness of the screens or sieves are now in use. The most important are of two types : (a) the use of a screen ⁸ supported at one end by a shaft on which a pulley is mounted eccentrically with the result that the screen is vibrated irregularly ; (b) the Hum-mer screen ⁹ in which the screen-cloth is vibrated by means of an electro-magnet and; (c) the Vicona screen ¹⁰ which is conical and so very compact and has the further advantage of being enclosed in a dust-proof case.

(vii) The use of a jaw-crusher or pair of crushing rolls prior to the grinding mill.

(viii) The greatly increased use of mixers in which the clay and water are incorporated. Some of the earlier machines were seriously wanting in this respect, but the interposition of one or two additional mixers between the screen and the brick-machine is now common and has fully justified the cost.

(ix) The increased use of belt and other conveyors.

(x) The use of a preliminary dryer which enables almost any clay or clay shale, no matter how wet it may be in its natural state, to be ground, screened and then made into bricks.

The stiff-plastic process itself is not new, but its greatly extended use in recent years has enabled it to remain as one of the most important of the “ modern ” methods of brickmaking.

THE SEMI-DRY PROCESS.

The “ semi-dry ” or “ dust ” process of brickmaking so closely resembles the “ stiff-plastic ” process that it may almost be regarded as a modification of it.

⁷ Supplied by Ruston-Bucyrus Ltd., Lincoln.

⁸ Supplied by Huntington, Heberlein & Co., Ltd., London.

⁹ Supplied by Mining and Industrial Equipment, Ltd., London.

¹⁰ Supplied by George Fletcher & Co., Ltd., Derby.

If the clay or shale does not contain more than about 5-7 per cent. of water it will not produce a "granular" material, such as the damper material used in the stiff-plastic process, but will form an apparently dry powder when ground and screened.

The semi-dry process was originally devised for use with apparently dry materials containing not more than 6 per cent. of water. It is now also used for plastic clays and some soft muds by first passing them through a rotary dryer and then proceeding as though a naturally dry clay or shale had been used. The simplest form of the plant used for the semi-dry process consists of a grinding mill, screen and press, the two former being of the same type as for the stiff-plastic process.

IMPROVEMENTS.

Among the improvements made during recent years in plants using the semi-dry process, may be mentioned :—

(i) A great extension in usefulness has been reached by a preliminary drying of raw materials for which the process is ordinarily unsuitable, though this is not an essential part of the process itself.



FIG. 9.—Ratcliffe Tipping Machine.

(By courtesy of London Brick Company and Forders, Ltd., London.)

(ii) A great reduction in the cost of getting the raw shale or clay (including the removal of overburden) has been secured by the use of what are generally known as steam navvies, though they may equally well be driven by oil or electricity instead of steam. These are sometimes used in a modified form in which a scoop is lowered by a rope from the end of a boom or jib and dragged back by another rope. The systematic use of such navvies at different levels, and the use of the Ratcliffe Tipping Machine (fig. 9) for conveying the overburden to the tip have reduced the cost of getting the clay to a remarkable extent. The Tipping Machine is like a

huge see-saw ; a wagon at one end is filled with clay or shale and then runs to the other, where it is tipped and returns empty, ready for re-filling.

A hopper into which the mechanical shovel delivers its load, the wagons being loaded from the hopper, has also proved very useful in some works as it enables small wagons, with all their advantages, to be filled from a large navy.

Another machine, of which "great things" are expected, is the shale-planer. This machine, which is about 80 ft. high, may be compared to a bucket elevator in which the buckets are replaced by knives so that only a thin slice of the shale face is taken from top to bottom. By this means the maximum uniformity of material is obtained.

(iii) Various ingenious forms of spray or atomisers for supplying a very small proportion of water have been devised and replace the crude devices used ten and more years ago.

(iv) The use of improved means for thoroughly mixing the materials from different strata and the uniform incorporation of the small proportion of water which must, sometimes, be added.

(v) The presses used for shaping the semi-dry bricks are not only made more powerful, but some are able to produce four bricks at a time, instead of the single or duplex presses formerly produced. Represses, working synchronously with the others, are also used.

It should, of course, be realised that the use of such devices is not limited to the semi-dry process. They can be employed wherever the scale of operations is sufficiently large to justify their cost. It is largely a coincidence that they happen, in this country, to be used more in connection with the semi-dry process than with other methods of brickmaking.

CONTINUOUS KILNS.

Most bricks made by the stiff-plastic and semi-dry processes are burned in continuous kilns, to which they are taken direct from the machines without any intermediate drying. The apparent saving in cost is, therefore, considerable, and though the gain is not so great as might be expected—for the moisture present in the bricks has to be removed in the kiln instead of the dryer—it is still sufficiently large to make both these methods of manufacture very popular.

Continuous kilns are of several types, and numerous patents have been granted with regard to them, but for the present purpose only two main types need be considered—the Hoffman type and the Tunnel type.

The *Hoffmann kiln*, invented by a German architect in 1858 and introduced into this country in 1863, was the forerunner of most of the continuous kilns used for brickmaking ; it is so well known that a description is unnecessary.¹¹

Many modifications of the Hoffmann kiln have been made ; most of them are included in (i) the "Staffordshire" kiln patented more than twenty years ago by

¹¹ See the lecturer's *Kilns, and Kiln Building* for descriptions of most of the kilns mentioned.

Dean, Hetherington & Co. ; (ii) the Bühler kiln (Eng. Pat. No. 562 of 1867), and (iii) various "archless kilns ;" one of the earliest of these was Bull's patent (1871), of which an ingenious modification with small fans instead of a chimney has been used for several years at Fletton.

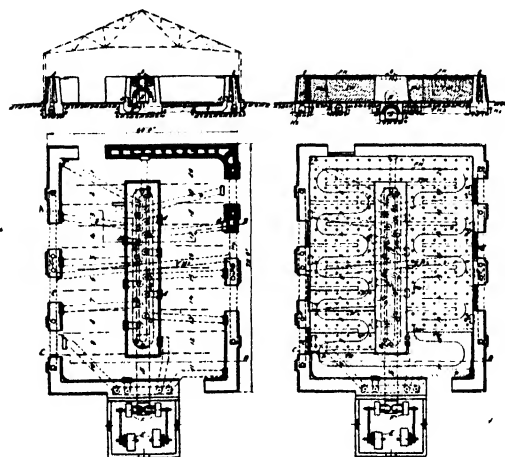


FIG. 10—Two plans and Sections of the Habla Kiln.

(By courtesy of Habla Bros. Patent Kiln, Ltd., Longport, Staffs.)

The latest kiln to be derived from Hoffmann's invention is the Habla kiln¹² (fig. 10), which may be regarded as a combination of the Bock Archless kiln and the Bühler kiln, or as a Bühler kiln without an arch (fig. 11) and with temporary partition walls made of dried bricks instead of permanent walls. It has all the characteristics of an ordinary (archless) continuous kiln of the Hoffmann type, but combines the advantages of great effective length in a very compact form which is the chief feature of Bühler's kiln. This great length (which is by no means a novelty) enables the fire to travel rapidly, as was shown many years ago by Jacob Bühler, who was able to burn bricks in some of his kilns at eight and nine times the rate attained in an ordinary Hoffmann kiln, without any damage to the most tender bricks, and as it produced a much greater supply of available waste heat than an ordinary continuous kiln, the Bühler kiln is able to dry as many bricks as the kiln will burn from the available waste heat from the kiln.

The Habla kiln (fig. 10) has, however, greater advantages than the comparison just made would indicate, for it has : (i) a greater capacity in comparison with the space occupied than any other continuous kiln ; (ii) a greater effective length in respect to area ; (iii) a lower fuel-consumption ; (iv) a lower cost of construction in comparison with the output ; (v) greater comfort for the setters and drawers ; and (vi) the hot-air flue operated by a fan constitutes an additional feature not usually found in the other kilns mentioned. The Habla kiln thus has six very

¹² *Brit. Pats.* 242,051 and 311,884.

important features. It combines all the advantages of the simple Hoffmann, the Archless (Bock), and the Bühler kilns (fig. 11) and is cheaper to build and easier to work than any of them having an equal output. It is primarily a kiln for common bricks, but with care it is possible to produce a sufficient proportion of facing bricks to meet any manufacturers' requirements. The chief advantages of such a kiln are its low cost of construction and maintenance and the small amount of fuel used per thousand bricks burned. Being archless, it is unusually elastic, can be extended indefinitely at a relatively low cost, and should the works have to be dismantled, the amount of brickwork left in the form of a kiln is at a minimum. The ingenious use of an annular hot-air flue enables the bricks to be dried thoroughly and warmed to 200 degs. C. before they are brought into contact with the kiln-gases. The cost of forming and removing the upper courses of bricks and plates which serve instead of an arch is small enough to be negligible in comparison with the other savings effected.

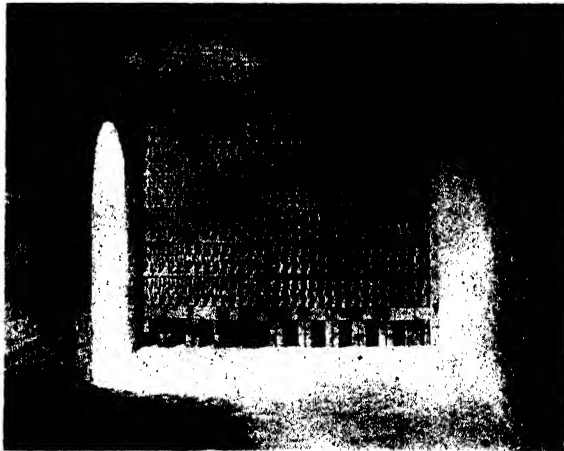


FIG. 11.—Bühler Kiln with Flat Top.

(By courtesy of Arnold Bühler, Constance, Germany.)

DRYING FRESHLY-SET GOODS IN THE KILN.

One of the most important constituents of a modern continuous kiln for burning facing bricks is some positive means for drying the freshly-set bricks and raising them to a temperature slightly above the temperature of boiling water by means of clean, hot air. If the kiln-gases are used for this purpose the bricks will be spoiled by *scum*. Most of the hot air required can be drawn from the chambers containing cooling bricks, but many of the arrangements built for that purpose do not work satisfactorily, because they depend on a variable chimney-draught instead of the positive action of a fan, and, consequently, they do not supply sufficient air in a suitable manner to the bricks and they do not remove the steam from the bricks in a satisfactory manner. To overcome this very serious dis-

advantage and enable the kiln to burn at the same rate as when only dry bricks enter it, the freshly-set chambers must be supplied with an independent chimney or other draught-creating device. Andina and Bottomley patented the use of a separate chimney in 1911, but whilst this works well under some conditions, it is not sufficiently positive for all kilns and a fan is far better. A kiln with two fans—one for the ordinary draught and the other for the freshly-set chambers—has been in use for nearly ten years in Nottinghamshire and has given complete satisfaction.

Still more recently, other kilns have been fitted with a fan and a hot-air flue composed of well-lagged metal, and a welcome increase in the output has been the result.

Sometimes a small, portable fan attached to the wicket or entrance of a freshly-set chamber will have a beneficial effect, but some of the fans used for this purpose are much too small to draw off the large volume (estimated at 4,000,000 cubic feet) of hot air and moisture which must be removed every 24 hours.

A fan of ample size is obviously essential and it should not revolve too rapidly or it will not withdraw the air from all parts of the chamber, but will set up eddies which cause incomplete drying and may cause some bricks to collapse by condensation of moisture on them. A very convenient arrangement (figs. 12 and 13) is that designed by British Air Conditioners, Ltd., Blackburn. A large horizontal pipe, well-lagged, runs the whole length of the kiln and has branches leading to each chamber. By means of a large stationary fan at one end of the kiln, air from the cooling chambers is drawn into this pipe and then through a chamber containing freshly-set bricks into a pipe placed near the wicket. This pipe is connected to a large horizontal pipe running along each side of the kiln and is connected to the fan; the latter discharges into the atmosphere.

It is important to have a fan of such a size so that five or more chambers can be dried simultaneously and hot air can be drawn from an equal number of cooling chambers. If the latter cannot supply sufficient hot air, a coke-fired stove can be connected to the large duct on top of the kiln and the amount and temperature of the air increased to any desired extent. This coke heater is very important, especially when a kiln has less than 20 chambers. For a very large kiln, two fans may be desirable in order to ensure a more balanced flow of air.

This use of a fan for creating a positive movement of prearranged amount in the chambers being dried is not strictly a "recent" improvement, but the form in which it is used in some kilns is of very recent origin.

AUTOMATIC KILN-FEEDERS.

Another great improvement, made since 1913, is the use of automatic feeders for the fuel. Under ordinary conditions about 2-3 lbs. of fuel is fed every 15 minutes through each feed-hole in the crown of the chambers being fired, but for various causes the intervals are often longer and the charges heavier than this. As a result, much of the fuel is incompletely burned and a considerable wastage occurs.

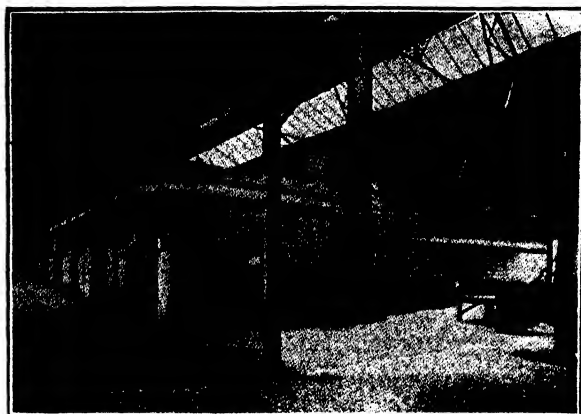


FIG. 12.—Brick Drying Plant showing Fan, etc., at end of Kiln.
(By courtesy of British Air Conditioners, Ltd., Blackburn.)



FIG. 13.—Brick Drying Plant on Top of Kiln.
(By courtesy of British Air Conditioners, Ltd., Blackburn.)

A skilled and really conscientious burner can usually do better than a set of automatic feeders, as he can “humour” the fires in various parts of the kiln and so “get the best out of the kiln,” but a fireman of average skill will do better with automatic feeders than without, and can, if the need arises, look after two kilns without undue exertion.

Each feeder consists of a hopper filled with coal and resting on a feed-hole—there being one hopper for each feed-hole in use at a time.

The coal is transferred from the hopper to the kiln by a mechanically-operated device, such as a small screw-conveyor below each hopper, the amount of coal supplied being regulated in a simple manner which differs with each type of feeder. Some of the early types easily set the fuel in the hopper on fire, but the better-

developed ones cannot do this and, in addition, they permit the interior of the kiln to be inspected through the feed-hole, which is covered by a glass plate.

The power required to drive the whole set of automatic feeders is so small as to be negligible ; when driven electrically, it costs less than $\frac{1}{4}$ d. per hour.

A well-designed automatic feeder will enable dust coal (fine slack) to be burned satisfactorily and without waste, so that apart from any saving in the quantity of fuel consumed, these feeders effect a further financial saving by enabling a cheaper slack to be used. This saving often amounts to 2s. per thousand bricks.

FUEL ELEVATORS.

A minor improvement, yet one worth mentioning, is the increasing use of automatic elevators for raising the coal from railway trucks or barges to the top of the kiln and distributing it thereon.

INSULATION.

The use of highly porous insulating bricks for reducing the loss of heat by radiation is a further recent improvement in kilns.

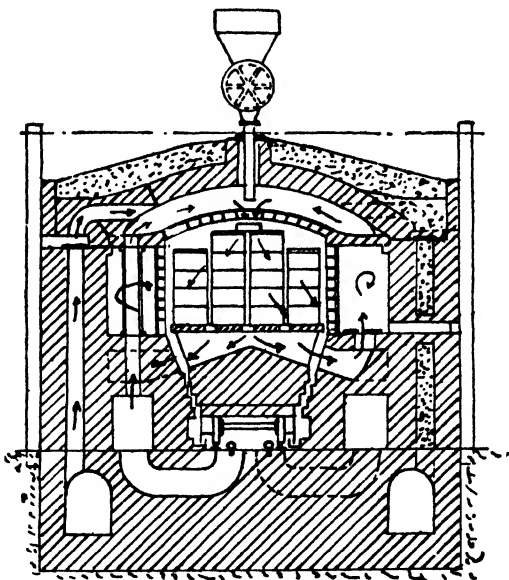


FIG. 14.—Section of "Willamson" Tunnel Kiln for Salt-glazing.
(By courtesy of Dean, Hetherington & Co., Accrington.)

THE TUNNEL KILN.

A form of kiln which is far from new (it appears to have been used first in 1847) is that known as a "tunnel kiln with cars" or more briefly as a "tunnel kiln." (Figs. 14-16). It consists of a long, structure (Fig. 15) capable of holding a large



FIG. 15.—Tunnel Kiln.

(By courtesy of Gibbons Bros , Ltd , Dudley.)

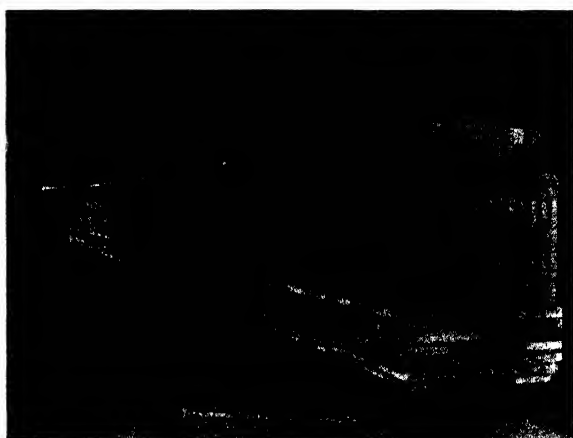


FIG. 16.—Bricks on Cars from Tunnel Kiln.

(By courtesy of Gibbons Bros , Ltd., Dudley.)

number of cars (Fig. 16) on which are placed the goods to be burned. The "hot zone" is usually near the centre of the kiln and on one side of it is the preheating zone, whilst the cooling zone is on the other side. The precise lengths of these zones and, therefore, the position of the hottest one, depend on the time required by the goods to pass through the various stages.

The cars may travel through the kiln at a constant rate, but it is more usual to move them all forward once every hour or every two hours, one car then being discharged and a fresh car introduced. In a kiln 350 ft. long, with cars 6 ft. in length, each carrying 1,000 bricks and moved forward at the rate of one car per hour, the output will be 24,000 bricks per day, which is nearly double that of many continuous kilns. In a kiln only 200 ft. long, the cars must be moved forward

less frequently or must travel continuously at a slow rate. If one car is discharged every two hours, the output of the kiln would be 12,000 bricks per day, which is about the average for a continuous kiln of the "modified Hoffmann" type.

In order to overcome the disadvantages of a long straight tunnel, Sir Arthur Duckham has designed a circular tunnel which is satisfactory. It differs from the straight tunnels not only in its shape, but in having the goods stacked on platforms which travel on wheels in fixed bearings; the latter are distributed uniformly through the kiln instead of the platforms and wheels being united to form a car or truck.

Tunnel kilns for small outputs are unduly costly, but the larger ones cost about the same as continuous kilns of equal output.

The chief advantages of a tunnel kiln are :—

(i) The cost of setting and drawing the bricks is reduced and the work is made much more comfortable.

(ii) The burning is under much better control, as most tunnel kilns use producer gas, and as each part of the kiln is maintained at a constant temperature much less skill in firing and control is needed than with other types of kiln. In some American tunnel kilns the temperature is controlled automatically by thermostats designed for the purpose.

(iii) If the bricks are dried on the same cars as those on which they are burned the saving in handling is equal to half what it costs with other kilns.

(iv) The burning can be controlled automatically by means of thermostats and by this means the chief difficulty in brick manufacture is largely avoided. Automatic controllers are not, at present, in use in this country, but have been employed in the United States for several years.¹³

For these and other reasons, the tunnel kiln is often described as "the kiln of the future."

The reason tunnel kilns made so little progress for so many years—for their rapidly extended use is less than twenty years old—is that the early ones were far too short and, consequently, the bricks were not properly burned and many of them were spoiled.

A very serious drawback of some tunnel kilns used for brickmaking (but from which the Dressler kilns of various types are all free) is the deposition of "scum" on the bricks shortly after they enter the kiln. Such a defect prevents a kiln from being used for any bricks except common ones. It is avoided in the Dressler kilns by withdrawing the preheating gases some distance from the entrance to the kiln and passing them through pipes, so that the freshly-entering bricks are warmed by radiated heat to such a temperature that by the time they come into contact with the kiln-gases no condensation can occur and no scum be formed.

A further disadvantage of tunnel kilns is that the goods must be dry, as the

¹³ The Wilson Maeulen Co., Inc., 734 East 143rd Street, New York, has supplied some of the most successful temperature controllers for kilns.

length of the tunnel does not allow sufficient time for drying as well as burning. By building a tunnel dryer alongside the tunnel kiln all difficulties with regard to the provision of dry bricks are avoided and a satisfactory arrangement is produced.

Tunnel kilns are not suitable for clays which contain so much carbonaceous matter that they must be burned very slowly with a restricted supply of air. The unsuitability is wholly a financial one and is due to the great cost of building and running a tunnel kiln through which the cars travel at a speed of less than 3 ft. per hour.

Electrically-heated kilns are now in use for some forms of pottery and are regarded as almost ideal. They require electricity to be extraordinarily cheap if they are to be used for bricks.

Quite apart from any other advantages which may be gained, the conditions under which a tunnel kiln is loaded and emptied are so superior that the work-people can do better work under much more healthy conditions than in the heat and dust inseparable from other kilns.

MULTI-COLOURED BRICKS.

The beauty of old brickwork is largely due to the variety of its colouring. Much of this is due to the effects of time and local surroundings and cannot be reproduced artificially. The splash of green lichen on a russet brick in the wall of a country vicarage cannot be accurately imitated by any chemical colouring. Nevertheless, some very beautiful effects can now be produced by the judicious and skilled use of artificially-coloured sands which are applied to the surface of bricks during the moulding or pressing, or subsequently to their extrusion from a mouthpiece. The sand should not be very fine and it is an advantage if the grains are irregular in size, though none should be more than 1-16 in. diameter. The colour of the raw sand is unimportant; the bricks owe their beauty largely to the colour of the sand after it has been through the kiln.

The coloured patches may also be produced by the direct application of a pigment, such as iron oxide, manganese oxide, or chromium oxide (mixed with a suitable proportion of red-burning sand or burned clay) to the freshly-shaped bricks, or the mixture of sand and pigments used for facing the bricks may purposely be made so irregular in composition as to produce the desired effect. Occasionally, both methods are used for the same brick.

Other colours, often equally pleasing, are produced by varying the atmosphere in the kiln or by allowing flames to play momentarily, or longer, on the faces of some of the bricks. There is an element of "chance" in the production of all these variegated colours which prevents precise duplication, yet a skilled burner can obtain results which are sufficiently uniform for most requirements.

The production of multi-coloured bricks involves nothing really novel in clay-working, but merely the application of well-known causes to produce certain effects. In some instances, what are normally regarded as defects are modified and controlled so as to produce pleasing results. Thus, the darkening in colour

and the production of various blue tints, which are the result of a reducing atmosphere in the kiln, form a defect if red bricks of uniform colour are desired, but are the cause of the variegated colours in some multi-coloured bricks.

The details of the various ways in which these multi-colours are produced are not of general interest.¹⁴ It is sufficient to say that red and brown tones are produced by an oxidizing atmosphere, but bluish and dark brown tones, some approaching black, are due to a reducing atmosphere in the kiln forming ferrous silicates of dark colour.

PAVING BRICKS.

Paving bricks are mainly used for footpaths and for stables and cowsheds in this country, but in America and elsewhere large numbers have been used for roads with considerable success. An attempt was made a few years ago to build up a road-brick industry in this country, but the Paving Brick Association which had the matter in hand did not meet with sufficient support and little is now heard of brick roads. This is peculiarly unfortunate, as vitrified bricks which are exceptionally resistant to abrasion and impact are admirably suited for roadways.

FIRECLAY BRICKS.

Until a few years ago, all the best fireclay bricks were made by hand, as it was thought that they were damaged by pressing. It has been found, however, that if only a small pressure is used, little or no harm is done, yet the accuracy in the shape and size of the bricks is greatly improved. At the present time, very large numbers of fireclay bricks of first-class quality are made by the stiff-plastic process.

The joints in the brickwork of a furnace are the weakest part of the structure. When hand-moulded bricks of irregular shape are used, the joints must necessarily be wide. With bricks made by the stiff-plastic process, however, the joints can be very thin and the durability of the brickwork is increased accordingly.

Another important, recent improvement in the manufacture of fireclay bricks is the much higher temperature at which they are now burned in the course of manufacture. Twenty years ago, relatively few fireclay bricks were burned at temperatures above 1280 degs., C., and many were finished at 1180 degs., C. Nowadays, a finishing temperature of 1500 degs., C. is regarded as normal in many works, and some fireclay bricks required for special purposes are burned at 1650 degs., C.; some makers claim that their kilns are finished at still higher temperatures.

BRICKS FROM COLLIERY-REFUSE.

The clays, shales, and schists now left in coal-mines or brought to the surface and tipped as refuse can, in many localities, be used profitably for the manufacture of bricks, though it is scarcely correct to state, as is done in a well-known book

¹⁴ Further details will be found in the forthcoming (3rd) edition of the Author's *Modern Brickmaking*, now in the press (Ernest Benn, Ltd.).

on Industrial Wastes, that "many of these schists are much more suitable for brickmaking than some of the clays now being used for the purpose."

The colliery-refuse consists of a highly complex and irregular mixture of bind or shale, underclay, silica rock, small coal or equivalent material, and such adventitious things as nails, hammer-heads, pieces of broken pick-axes, wooden props, and various other pieces of wood and metal. No attempt is made by the colliery managers to sort or classify it; the brickmaker can make what selection he deems suitable, but he receives little help in this direction from the colliery. This is all the more unfortunate, because a very little additional care in the pit would make an enormous difference in the quality of many of the bricks produced. In a few instances, where the brickworks and colliery are under the same management, more care is taken, and the improvement effected is obvious.

Among recent improvements in the use of this material are :—

1. Passing the material over a magnetic pulley which separates most of the "tramp iron." By this simple means, much damage to the machinery and many tiresome breakdowns are avoided.
2. Using a jaw-crusher for reducing the harder pieces of material before they enter the mill. This greatly relieves the strain on the grinding plant.

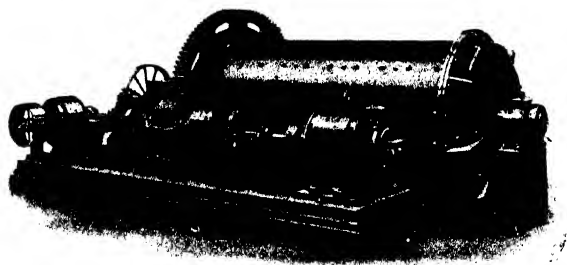


FIG. 17.—Rod Mill.

(By courtesy of Sutcliffe, Speakman & Co., Ltd., Leigh, Lancs.)

3. The use of a rod-mill (Fig. 17) (patented by Sutcliffe, Speakman & Co., Ltd.) instead of an ordinary pan-mill. The rod-mill consists of a long cylinder mounted almost horizontally on self-aligning bearings and provided internally with a number of long steel rods, $1\frac{3}{4}$ in. to 4 in. in diameter, the same length as the mill. As the mill rotates, these rods are raised and, later, fall on the material to be ground and on each other, with the result that a granular product of great uniformity is obtained with a small expenditure of power.

The great advantages of such a mill are (a) that it produces particles which are very uniform in size, with a minimum of dust or flour, and (b) that large differences in the proportion of moisture do not seriously affect the action of the mill, so that it is peculiarly suitable for the material from colliery tips.

4. The use of a powerful press and repress, the bricks being passed automatically from one to the other and then to a conveyor.

5. The better control of the burning so as to eliminate "cores" or "black hearts" in the bricks.

The improvements made in recent years in the utilisation of colliery-refuse form another example of what can be done by a careful investigation of the causes of certain defects or difficulties, and the application of scientific methods or specially designed or slightly-altered machinery of standard design, though not necessarily that used in the brick industry, to overcoming them.

OBITUARY

GEORGE TOYE.—The Society has suffered a serious loss in the untimely death of Mr. George Toye, one of the younger members of its staff, who was fatally injured as the result of a gun accident while out shooting last week during his holidays in Cornwall.

Toye, who was educated at the Hampton Grammar School, joined the Society's staff as a Junior Clerk in 1919, but some time afterwards underwent a course of instruction at a School of Printing, and in 1921 was placed in charge of the Society's printing department, which, mainly owing to his ability, produced work which received the praise of some of the leading printers in London.

Fellows attending the meetings, and also those who lecture before the Society, will read this announcement with more than ordinary regret, as Mr. Toye has, during the last five years, earned much praise by his skill in showing the lantern slides illustrating lectures given before the Society.

He was 28 years of age and is survived by a young widow.

NOTES ON BOOKS

NATURE AND ORNAMENT. By Lewis F. Day. Second Edition, revised with an additional chapter by Mary Hogarth. London: B. T. Batsford, Ltd. 7s. 6d.

Mr. Day's book is very reasonable. His theories are never overstated; one feels it would have been possible to argue with him without wrangling. That his style, the *tempo* of its progress from one point to the next, its mild and unaffected sentimentality, have a characteristically pre-war stamp, is no demerit. The book has not quite the suggestiveness—so often of rather a superficial kind—that we are apt to meet with to-day in minor works on the elements of design; it is chiefly concerned with the loving observation of vegetable nature, and the tracing of ornamental motives to natural sources of inspiration.

There are nearly a hundred illustrations which fulfil their purpose excellently. See, for instance, Fig. 9, Roman Column. The base certainly recalls the pattern of a palm trunk where the dead leaves have been cut away, and the diapers moulded on the shaft do look as if they have been suggested by scars on a tree trunk where branches have been lopped. At the beginning of his book, Mr. Day has put us on our guard against making exaggerated inferences against this sort of thing. Just as Owen Jones went too far when he said that "in proportion as design approached natural form, it has less claim on us as ornament," so Ruskin was obviously wrong when he declared "the forms most frequent in nature to be the most natural and the most natural to be the most beautiful." The truth, says Mr. Day truly, "lies midway between the two extremes—precisely at what point artists must discover for themselves."

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No. 4058

FRIDAY, AUGUST 29th, 1930

VOL. LXXXVIII

*All Communications for the Society should be addressed to the Secretary, John Street,
Adelphi W.C.2.*

NEWS OF THE WEEK

"If one thing is more true of Art than another, it is that Art is serious, not play but work, not mere exuberance, but a vocation; and if it were not so there would be no room for Art in serious life. It is the constructiveness of play from which Art is descended and not the playfulness of it."

Professor Samuel Alexander, Herbert Spencer Lecture, Oxford, 1927.

The Harrow Gasometer.—"There is a spot in the Churchyard, near the footpath, on the brow of the Hill looking towards Windsor, and a tomb under a large tree (bearing the name of Peachie or Peachy) where I used to sit for hours and hours when a boy; this was my favourite spot."

What Byron saw from these heights is, one gathers, in danger of desecration. Presumably more gas is required by the growing population of lower Harrow, and to supply them another gasometer is necessary. Must this of necessity destroy the beauty of that fine outlook or could it conceivably be so distressing as modern Harrow with its untidiness and ill-ordered advertisements. We are sure that Sir David Milne-Watson and Sir Francis Godenough will consider any proposal to place this necessary requirement of our modern life in the landscape in as seemly a way as possible. They painted their great Poole gasometer green, at the suggestion of a Fellow of the Society, and there is evidence that they are mindful of public amenities in all their activities. We believe that this might be made almost a feature in the broad landscape if placed rightly and if some tall poplars or other groups of planting were placed so as to reduce its scale, and if some consideration were given to the colour and design of the sky line of the holder.

We are not distressed at the appearance of such necessities of life so much as at all the untidiness that so often surrounds modern undertakings. We should prefer to have a properly placed gas-holder in view than the chaotic lines of a modern building estate.

After hearing more as to the proposal, we propose to illustrate the position of the holder as seen from Byron's seat and his famous School.

Alfred Stevens.—Considerable interest was taken in the lecture on Alfred Stevens at the Royal Society of Arts by Mr. D. S. McColl. The great sideboard,

the mirrors and one of the fine chimney pieces, which were shown on the screen by Mr. McColl, and illustrated in the *Journal*, were acquired by two Fellows of the Society. These have been housed for some time near London, and Fellows of the Society were given an opportunity of seeing them, but very little advantage was taken of this. Mr. Herbert Weld, of Lulworth Castle, who is a Fellow of the Society, inspected them, and expressed the greatest anxiety as to their permanent home. As Lulworth is so near Blandford, the birthplace of Alfred Stevens, he thought it would be particularly appropriate if they could be incorporated in the restoration of Lulworth Castle after the disastrous fire which entirely destroyed every decorative interest. Unfortunately, the plans for the restoration have not matured sufficiently for him to purchase these examples of Alfred Stevens' work for such a purpose. As they cannot remain indefinitely in the building where they have been set up for examination in Wimbledon, Mr. Weld has generously offered to defray the cost of their removal to a building in his park where they can be examined. This should be especially interesting to all Dorsetshire people and generally call attention to the work of a great English artist who found so little recognition in his lifetime.

St. John's College.—We propose to show a plan of the site next week, giving the accommodation possible for housing and at the same time retaining with real advantage this fine specimen of 17th century building.

PROCEEDINGS OF THE SOCIETY

CANTOR LECTURES

RECENT IMPROVEMENTS IN METHODS OF BRICKMAKING

By ALFRED B. SEARLE

Consultant on Clayworking Problems.

LECTURE III.—*Delivered March 3rd, 1930*

BRICKS OF NON-PLASTIC MATERIALS

In the two previous lectures, only bricks made of materials possessing some plasticity or capable of being made plastic were considered. Such materials—*viz.* clays, shales and certain mudstones—have always been the principal ones used for the manufacture of bricks, but they are by no means the only ones used for this purpose, and sand, clinker, slag, and other materials are now used.

LIME-SAND BRICKS

About fifty years ago, the manufacture of bricks from a mixture of sand with about one-sixteenth of its weight of slaked lime was commenced, and the resulting lime-sand bricks, or sand-lime bricks, soon became popular in localities where

sand is abundant, but clay is scarce. The method of manufacture is apparently simple : the sand, slaked lime and water are thoroughly mixed so as to produce a material which, under great mechanical pressure, forms bricks of any desired shape. These bricks are taken direct from the press to a hardening chamber in which they are heated by steam under a pressure of about 100-200 lb. per square inch. They are then allowed to cool and are ready for use, but they are improved by storage in the open air for a month or two before being used. The arrangement of a modern plant is shown in Fig. 18.

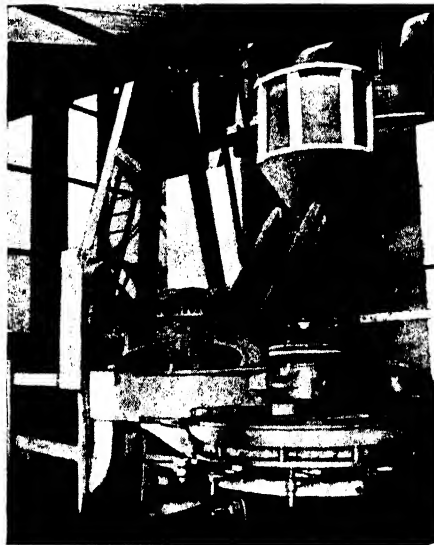


FIG. 18.—Sand-lime Brick Plant.

(By courtesy of Messrs. Herbert Alexander & Co., Ltd., Leeds.)

The steam and heat bring about a chemical reaction between the lime and some of the sand, and the compound so produced acts as a binder or cementing agent and gives the bricks a strength equal to that of ordinary building bricks.

The process is not quite so simple as it appears to be, for unless the lime is fully slaked and then distributed as uniformly as possible through the material, the bricks will be defective and may be useless.

IMPROVEMENTS

Amongst the chief improvements are :—

(i) The increase in strength and output of some of the machines used for making the bricks. Sutcliffe, Speakman & Co. Ltd., Leigh, Lancs., are now making machines (Fig. 19) which apply a pressure of 200 tons per brick and produce 2,500-3,000 bricks each per hour, the speed being limited by that at which the bricks can be removed from the press. This machine is said to be the only one of

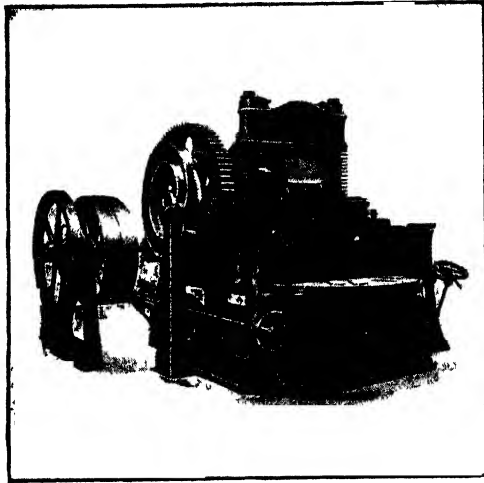


FIG 19 —Emperor Press for Lime-sand Bricks
(By courtesy of Sutcliffe, Speakman & Co, Ltd, Leigh, Lancs)

its type having a cast-steel table. The thickness of the bricks is constant, but their density is varied by means of an adjustable race controlled by a hand-wheel.

(ii) Another great improvement is in the use of air-separated hydrated lime in place of lime slaked in the brickworks.

(iii) A much better and more thorough mixing of the lime, sand, and water than was formerly the case—particularly on the Continent. In modern plants an edge-runner mill, designed for mixing and not for grinding, is generally used, but sometimes a Rod-Mill is used and is found to be advantageous, particularly when the sand contains coarse particles.

(iv) The use of a higher steam-pressure in the hardening chamber, whereby the time required is reduced. A pressure of 200 lb. per sq. in. is now used regularly in some Continental works, but it is generally found that with a pressure of only 165 lb. per sq. in., a steaming period of $4\frac{1}{2}$ hours is ample.

(v) On the Continent, rapid means for closing the hardening chambers are being increasingly used, though no completely satisfactory and durable device is available.

(vi) Sutcliffe's patent grab or "lifter" facilitates rapid handling of bricks in large quantities. With it, two men can readily stack or load onto trucks 30,000-35,000 bricks per hour, or 15 times as rapidly as if the bricks were moved by hand. It can be used for any bricks which are sufficiently accurate in shape.

SLAG BRICKS

A modification of the same process, but using granulated slag from iron and steel furnaces, enables bricks to be produced from what has, hitherto, been a waste product of little value. The process used for slag bricks is essentially the same as that used for lime-sand bricks, the chief differences being those due

to the use of slag instead of sand. It is essential to granulate the slag and so reduce it to a suitable powder which must then be drained by screens.

It is also essential that any free lime in the slag shall be fully hydrated before the bricks are made, as otherwise they would be cracked in the hardening chamber.

The use of slag for brickmaking is by no means new, but the bricks now made from this material are much superior to those made some years ago, because more is now known of the necessity for adequate grading of the granulated slag and for the proper slaking of the lime. The result is that whilst the changes made in the machinery used are only slight, the modifications in the use of the machinery produce greatly improved bricks.

CLINKER BRICKS

Similar improvements have been made in the manufacture of bricks from the clinker from refuse-destructors. Such bricks are excellent for many building purposes. As the lime and silicates in the clinker hydrate very slowly, Sutcliffe uses a steam-jacketted mixer and stores the mixed paste for 24-36 hours before making it into bricks, or passes the clinker through a steel revolving cylinder, 5-7 ft. in diameter, in which it is exposed to steam for several hours.

Such bricks must not be confused with the clinker bricks made on the Continent, and particularly in Germany; the latter, made of clay and having multi-coloured faces, have recently become very popular. They are made in the same manner as other multi-coloured bricks, the variegations in colour being produced by controlling the nature of the atmosphere in the kilns during the later stages of the burning.

BRICKS FROM OIL-DISTILLERIES

The residues from the stills used in the Scottish oil industry consist of lightly calcined shales. They have been used to a small extent for the manufacture of bricks, but the chief objection is the large proportion of carbonaceous matter they contain which makes them unusually liable to produce " hearts " and swollen bricks. This difficulty can be avoided by using the same process as for lime-sand bricks, as the heat developed is not sufficient to ignite the carbonaceous matter.

CEMENT-SAND OR CONCRETE BRICKS

The facility with which Portland cement can be used to produce blocks and slabs of concrete has naturally led to its employment for bricks. The concrete may be made by mixing sand, brick-dust, crushed stone, or waste materials of various kinds, with about one-sixth of its volume of Portland cement and sufficient water to form a soft paste or mortar which can then be shaped by any simple form of mould. As the articles are improved by the application of a slight pressure during the moulding, most of the machines used for making concrete bricks and blocks are so designed that the requisite pressure is applied automatically.

The machinery used in making cement-sand or concrete bricks is usually of two

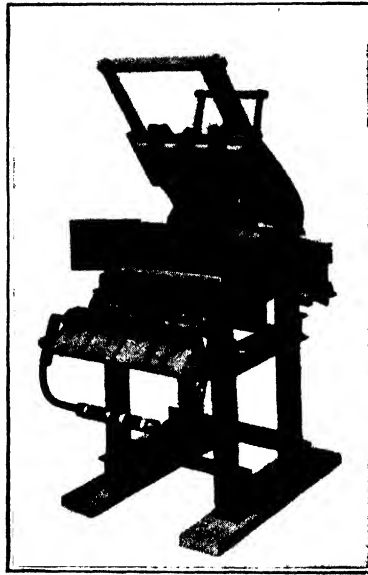


FIG. 20.—Press for Concrete Bricks.
(By courtesy of Winget, Ltd., London.)

kinds : (i) that used for mixing the materials and forming the paste or mortar and (ii) that used for shaping the bricks (Fig. 20). So long as a good mixture is produced, the precise type is relatively unimportant and if the moulding machine makes good bricks its value will depend chiefly on such details as ease of manipulation, the number of bricks produced at a time and so on.

The chief improvements made in the manufacture of these bricks in recent years are due more to small details than to fundamental changes in the design of the machines. The numerous scientific investigations on the grading of the aggregate, the optimum proportion of water, and the rules regulating it have also proved of great benefit in the manufacture of concrete bricks. Indeed, the most important part of the whole process is the production of a good concrete of suitable consistency ; once this is secured, the actual shaping of the bricks is quite simple.

The use of rapid hardening cement—which enables the bricks to be used the day after they are made—and a much greater knowledge of what occurs during the setting and hardening of concrete have led to a further improvement in the manufacture of concrete bricks. It is now known that the bricks should be kept saturated with water for at least a week after they have been made and various ingenious devices for ensuring this are in use.

PUMICE BRICKS

A variety of concrete bricks which has been used since the times of the Ancient Greeks and Romans is known as Floating Bricks or Pumice Bricks. For many

years, the secret of their manufacture was lost, but they have been made for about 200 years in Rhineland, and, recently, a firm in this country has started to make them near Whitstable.

Pumice bricks are very light and porous. They are chiefly used for floors and partitions. The pumice forms the aggregate; it is bonded with some form of cement—preferably Portland cement.

Bricks of diatomaceous earth (kieselguhr) are used for the same purpose as pumice bricks.

SILICA FIREBRICKS

The use of a very pure quartzose rock—some containing 99 per cent. of silica—for the manufacture of firebricks for lining furnaces and coke ovens and for the construction of gas retorts and other purposes began about 1822, but it has been greatly extended during the last twenty years.

These bricks are of two kinds: (i) the lime-bonded bricks in which the silica is mixed with $1\frac{1}{2}$ -2 per cent. of slaked lime, and (ii) clay-bonded bricks in which about 5 per cent. of clay—either naturally present or added purposely—forms the bond.

At one time, silica firebricks were exclusively made by hand-moulding, but in recent years, machines of the "stiff-plastic" and "semi-dry" type have been used with considerable success. It is most important that only the pressure really required should be applied, an excessive pressure causing the bricks to spall badly when in use. The bricks are dried and then burned at temperatures of 1,250-1,700 degs., C., according to the quality desired.

The improvements made in the last twenty years are almost wholly the result of careful scientific research, much of it of a wholly academic character. Its utilization is one of the most interesting examples of how physical and chemical investigations undertaken primarily without any industrial aim may, when properly applied, be of very great value to an ancient and apparently unscientific industry.

The important changes which take place when silica is heated to a high temperature are now fairly well understood, and the importance of using, as raw materials for silica bricks, those forms of silica which are most easily converted into cristobalite and tridymite is being increasingly appreciated by brick manufacturers. The technique necessary for this change does not involve any appreciable change in the plant and machinery used, but is concerned with such matters as the selection of suitable rock, grinding it to particles of suitable sizes, and heating the bricks under such conditions that the maximum conversion commercially attainable is reached.

The greatly improved technique has resulted in a corresponding improvement in the quality of the bricks, and this, in turn, has led to their greatly extended use in several industries, of which coke and steel manufacture are, perhaps, the most important.

MAGNESITE BRICKS

A corresponding result, though of smaller financial magnitude, has been obtained through scientific investigations into the changes which occur when magnesite is subjected to a prolonged heating. About twelve or fourteen years ago, most of the magnesite bricks made in this country were of imperfectly prepared material, with the result that the bricks were unduly sensitive to sudden changes in temperature. It has since been found that by fusing the magnesite electrically, or by using a form of magnesite (breunerite) which contains about 7 per cent. of iron oxide, a "dead-burned" material is produced from which bricks can be made which are far less sensitive, and that bricks composed wholly of periclase—the crystalline form of magnesia obtainable from the fused material—are not very sensitive.

Here again, the improvements have been made in technique rather than in the machinery and plant employed.

CARBORUNDUM BRICKS

Carborundum—an artificially prepared compound of silicon and carbon—is highly resistant to heat, and at the same time has a much greater thermal conductivity than other equally refractory materials. Bricks made of carborundum are, therefore, being used increasingly for muffles, retorts, and furnaces in which articles or materials are required to be heated by radiation and conduction rather than by direct contact with flame. The saving in fuel which is effected by using carborundum bricks in some enamelling kilns and annealing furnaces is very large.

ZIRCONIA BRICKS

Since the War, the demands for bricks which will withstand the highest temperatures obtainable industrially has led to the use of various substances of high melting point which are generally regarded as "rare" materials. One of these substances, *zirconia*, has received a large amount of attention, and although some users have met with many disappointments, bricks made of it appear to possess several characteristics of great importance in the metallurgical industries.

SILLIMANITE AND MULLITE BRICKS

Another highly interesting result of purely academic research is the production of what are known commercially as sillimanite bricks. It was discovered some years ago by Rankin and Wright that when a fireclay is heated to about 1,300 degs., C. and the cooled product treated with hydrofluoric acid, a felted mass of lathlike crystals is left behind. The chemical composition and optical characters of these crystals seemed to show that they were composed of equal molecular proportions of alumina and silica, $\text{Al}_2\text{O}_3\text{SiO}_2$, the natural mineral form of which is *sillimanite*. A further investigation by Bowen and Greig showed, however, that in most cases the crystals were not sillimanite, but a substance of very similar composition, with the formula $3\text{Al}_2\text{O}_3\cdot 2\text{SiO}_2$, known as *mullite*, and it is now generally agreed

that mullite is the correct name. Unfortunately, the term sillimanite rapidly found its way into the technical papers, and "sillimanite" bricks are now a regular article of commerce.

As mullite, or sillimanite, is a very highly refractory material, attempts were soon made to produce it artificially by heating mixtures of alumina (bauxite) and clay in suitable proportions. Such bricks made of synthetic mullite were rapidly gaining favour under the name of sillimanite bricks, particularly in the United States, when an important discovery of a large mass of natural sillimanite was made in Northern India. This has since been imported to Europe and America and is the chief material from which modern sillimanite bricks are made.

IMPROVEMENTS IN THE USE OF FUEL

Very little improvement has been made in the use of fuel in the manufacture of bricks during the last twenty years. Crude coal is still the principal fuel, though producer-gas is being increasingly used in burning firebricks and in tunnel kilns.

During the Great Coal Strike a few years ago, a considerable number of firms used oil as a substitute for coal. At the present time, it is cheaper to use coal for burning bricks in the British Isles, but in some other countries, the use of oil is cheaper and fully as effective. For drying bricks, several firms have found that oil is cheaper than coke, chiefly because it requires so little attention.

IMPROVEMENTS IN TECHNICAL CONTROL

As the size and output of brickworks increases, it becomes more and more necessary to utilise means of control based on the use of draught-recorders, recording pyrometers, steam-meters, and other appliances which were, a few years ago, regarded as "too scientific" for brickworks. These devices are being increasingly used and appreciated and so need not be described in detail.

The Monnier Draught Regulator has been devised for automatically regulating the draught in the main flue. It consists of a bell or dome which floats on water, being partly supported by a counterpoise which can be adjusted to correspond to any desired draught. If the draught in the chimney is greater than that to which the regulator is set, gas is drawn out of the holder which sinks and with it the flue-damper which is suspended from the bell, and the draught is reduced. If more gas enters the bell than flows out of it, the bell rises, lifting the damper, and again adjusting the draught. The quantity of gas entering and leaving the bell is proportional to the draught. It is dependent on the weight of the bell and this, in turn, is regulated by increasing or reducing the counterpoise weights.

PSYCHOLOGICAL IMPROVEMENTS

The application of psychology, including such subjects as motion-study and fatigue, to brickmaking has already begun with highly beneficial results. Few brick manufacturers have realised the well-known psychological fact that the size

of the work-zone is of great importance, *i.e.*, that there are certain positions in which a man can do the maximum work. Beyond these, *strain* is produced so that no work should be done outside the optimum work-zone.

In many instances, the men do not fit the work or machine. They are too short or too tall and thus work outside the work-zone. This means working at a disadvantage, creating strain, fatigue, slipshod work, and waste. Some recent investigations by the Building Research Board on the height of the handles of wheel-barrows used in brickworks are typical of what is required. Another instance of a simpler kind is that of two workers who were operating a hand-press. The table at which they worked was so wide that each had to push the bottom die two feet, back and forth. This was nearly one foot too much. By making the table narrower, the work was made easier and the output increased 15 per cent.

All work should be done as close to the waist-line as can be arranged, and not more than a foot away if that is at all possible.

The "welfare of the worker" and "the personal touch" are far too important to be mere phrases; a study and application of them to brick manufacture is beneficial to all concerned.

RATIONALISATION

Rationalisation is bound to occur to a still further extent in the brickmaking industry, but those concerned in it must not overlook the fact that there is a limit to the feasible size of brickworks in each locality and that to go beyond this is to incur serious loss. Rationalisation must also deal with prospective sales as well as possible output.

RESEARCH

Clay is a peculiar and variable material; it is far more sensitive to delicate chemical influences than most people realise, and our knowledge of the chemistry and physics of clay is still of an elementary nature.¹⁵

There is ample scope for research in almost every branch of the industry, just as there is room for ingenuity and inventiveness in almost every process, machine, and appliance employed.

CO-OPERATION

Fifteen years ago, managers of different brickworks dared scarcely speak to each other. To ask permission to look over a works was, in most cases, equivalent to seeking a refusal. To expect owners and managers to meet and discuss technical and other problems was to behave as a visionary. Now, all that has changed; the owners have their Associations united in a Federation which has already done some excellent work and is constantly finding more to be done, for these bodies have scarcely touched the fringe of the technical side, though some local associations have arranged technical lectures and demonstrations for the benefit of their members.

¹⁵ See the lectures *Chemistry and Physics of Clay and other Ceramic Materials* (Ernest Benn, Ltd.).

The National Association of Clayworks Managers holds meetings every month, in five or six parts of the country, where technical and other matters are discussed with a vigour and zeal which augurs well for the future, and in the Institute of Clayworking those who are interested in the industry can find a society capable of organising discussions and conferences on matters of equal importance to all.

The English Ceramic Society has a section devoted to brickmaking and allied interests. Meetings are held periodically at which papers on scientific and technical subjects are read and discussed.

Industrial and scientific journals devote much more space than formally to brickmaking and the properties of various kinds of bricks.



FIG. 21.— Recorder for showing the times when machines are at work.

(By courtesy of Servis Recorders, Ltd., London.)

FUTURE IMPROVEMENTS

The prospective improvements in the brickmaking industry are numerous ; they involve a more detailed examination of the materials used, both in the raw state and in various stages of manufacture and use, the greater employment of pyrometers and draught-gauges to ensure better control of the kilns in which the bricks are burned, devices for recording the time the machines are actually at work (Fig. 21) and for the general rendering of the machinery and kilns more automatic and fool-proof than at present. With the increasing difficulty experienced in obtaining men having the requisite ability, skill and temperament, it is becoming yearly more necessary to design and employ machines and kilns in which a minimum of skill is required. For this reason, the whole trend of the industry is towards an increased "mechanisation" and a lessening reliance on skilled workers.

The application of Rationalisation and of Psychology to secure better conditions for the diminishing number of workers employed relative to the output as well as to increase their individual usefulness, is essential to further progress. In addition, the future success of the industry will depend on wise and enterprising development based on accurate, scientific, engineering and market research,

with greater attention to salesmanship, better and more extensive advertising, and, above all, on taking much more altruistic interest in the prospective Buyer and User and in making greater efforts to supply him with cheaper yet better bricks. The profitable manufacture of bricks is an industry involving the application of complex chemical and physical reactions at all temperatures from zero to a white heat, on an enormous scale and within a margin which leaves extremely little room for serious errors.

Hence, the ever-increasing need to make use of every facility in machinery, plant, technique and scientific knowledge, and of a growing regard for the welfare of the workers, in order that the future of the industry may not be merely assured, but that it may be increasingly prosperous.

The manner in which enormous difficulties have been overcome in this industry in the six thousand or more years of its existence augurs well for its future

The author's thanks are due to a large number of engineering and kiln-building firms for facilities afforded in preparing more than 200 illustrations (including a few in colour) employed in the original lectures. Some of these have been reproduced in this reprint, and, as far as possible, the illustrations or text bear the names of the manufacturers of the articles.

A demonstration of the relative effectiveness of various kinds of ventilators for drying floors was shown by means of a model, loaned by The Wolverhampton Corrugated Iron Co., Ltd., of Ellesmere Port, Cheshire, which enabled the suction created by an artificial wind of known velocity passing over, through or alongside the ventilators to be measured.

GENERAL NOTE

INDEX OF ARCHITECTURAL RECORDS.—A Committee representing the Royal Archaeological Society; the Royal Institute of British Architects; the London Survey Committee and the Society for the Protection of Ancient Buildings has been formed to explore the possibility of compiling a central card index of prints, drawings and other architectural records. It is felt that this should be of great assistance to those engaged upon the repair of old buildings, to writers of architectural, archaeological or topographical works and to students generally.

If it should meet with success it is not unlikely that it would be developed to include some means of storing such records in a central and safe place, should they be loaned, offered or bequeathed.

It is proposed to limit the scope of the Committee's work to buildings at least a century old and to those of England only, but it is hoped that parallel action will be undertaken in Scotland and Wales.

It is realised that an immense amount of such records are in private hands, and it would be useful to the Committee if owners would give particulars of their collections now, for with this knowledge the Committee will be better able to form an idea of the extent and scope of the enterprise. Owners are requested to address communications to Mr. A. R. Powys, Secretary, Society for the Protection of Ancient Buildings, 20 Buckingham Street, W.C.2.

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No. 4059

FRIDAY, SEPTEMBER 5th, 1930

VOL. LXXVIII

All Communications for the Society should be addressed to the Secretary, John Street, Adelphi, W.C.2.

NEWS OF THE WEEK

"The excellence of every art is its intensity capable of making all disagreements evaporate from their being in close relationship with beauty and truth."

John Keats.

"Without his moral sublimity, without the 'soul-making,' as Keats calls it, Lister could never have changed the face of surgery. That inward light, the 'light of Christ in the conscience,' which shone so steadily in Lister, is a beacon which will continue to shine on through the ages, giving heart to great men who battle with prejudice, that emotional reaction of ignorance to truth, which is the real obstacle to every advance."

Lord Moynihan, British Medical Associations, Winnipeg.

Electrification of Main Line Railways in the London Area.—

Mr. Alfred Bossom, F.R.I.B.A., has followed up his letter to *The Times* on this subject, to which reference was made in the *Journal* of June 20th, by an interesting article entitled "London's Gold Mine" in *The Spectator* of July 26th. The "boxing in" of the main lines would create, Mr. Bossom estimates, 350 acres of new building ground which would greatly facilitate the problem of the clearance of slum areas. Such an increase in the area available for building might even make it possible to devote some portion of existing slum areas to parks and open spaces. Electrification would also result in a considerable diminution in the amount of smoke and soot discharged into the London atmosphere. To quote from the article:—

"The railway companies have at their call 350 acres of land within the confines of London, and they make nothing of it! By forming a subsidiary corporation to handle the construction work, build the land above the tracks, develop it by shops, offices, houses or whatever type of building was most suited to the locality, and collect the rents therefrom, they would soon pay for the costs of electrification and find themselves in permanent possession of a large and expanding income . . .

When the electrification of the trains entering the London termini is completed the need for those huge arched iron and glass edifices that we know as Euston, Liverpool Street, Waterloo and so on will disappear. A station will . . . be flat-roofed, it will be reasonably low, it will make together with the adjacent goods yards, if not an ideal, at any rate incomparably the most convenient and accessible landing-stage for the air-taxis of the not distant future. In fact, with vision and boldness, to their own and everybody else's profit, the railways can largely regain their old prosperity."

Mr. Bossom is an Englishman with many years of professional experience of constructional work on a large scale in the United States, and as an Alderman of the London County Council he has an additional interest in the problem from a civic standpoint. He is certainly exceptionally well qualified to express an opinion on a matter of this kind and we hope his views will be given careful consideration by the railway companies and the public authorities concerned.

Lord Lister.—Lord Moynihan's eloquent oration on Lister, at the 98th Annual Meeting of the British Medical Associations, held at Winnipeg, recalls the fact that his name appears on the new buildings of the School of Hygiene and Tropical Medicine, with the other great names associated with hygiene. So little seemed known about many of the names inscribed on this building, that it was suggested that short monographs, with portraits, might make a book of interest. Such a book has been written by a Fellow of the Society, Mrs. Walker, and an interesting review of this, by Professor Elliott-Smith, recently appeared in the Journal. In her note on Lister, Mrs. Walker mentions that in 1880 honours began to come to him, but, in reciting these, she omits to state that in 1894, "the Royal Society of Arts awarded Lister the Albert Medal for the discovery and establishment of the antiseptic method of treating wounds and injuries, by which not only has the art of surgery been greatly promoted, and human life saved in all parts of the world, but extensive industries have been created for the supply of materials required for carrying the treatment into effect."

Sir Aston Webb, R.A.—It is fitting to recall here that, in the death of Sir Aston Webb, the Society has lost a Fellow of twenty-five years standing and a holder, since 1927, of its Albert Medal. His loss to the architectural profession, of which he was so distinguished a representative, is great. He also had the distinction of being the first Architect President of the Royal Academy of Arts for many years and until the unfortunate accident after a function there, which slowly brought to a close a life of exceptional output and social activity in the interest of the arts. The record of his work in London alone is too well known and important to recite. He began work at a time when architects were still playing with their sketch books of Gothic motifs and resisting the engineering necessities of the near future. It was a misfortune, no doubt, that he never had to submit his architecture to that process of ornamental elimination which is so satisfying and, when carried

to its extreme economic limits, is defined as "modernism." To make additions to Inigo Jones's perfect architectural fragment, the Banqueting Hall in Whitehall, was a responsible task, and called for a reticence which has been achieved. We are always grateful, when we look at these additions, to Sir Aston Webb for his fine taste in avoiding any monumental comparison with so considerable a model of perfect form.

Sir Lawrence Weaver. Speaking at the Architectural Association, and distributing the prizes for the students, the Swedish Ambassador (Baron Palmstierna) prefaced his remarks by saying that he would seize the opportunity, the first he had had, to recall the name of one who had passed over to the land of shadows, Sir Lawrence Weaver. Sir Lawrence Weaver had been a man of great talents, with a soul of fire, who had devoted himself to bringing beauty into our everyday life. He lived on the borderland of architecture but reached out in many directions. He had been a great personal friend of his own and one of the first, after the war, to bridge over between Sweden and this country. His memory would last.

The proposal to commemorate Sir Lawrence Weaver's activities in all departments of the architectural and industrial arts is still under consideration, but his many friends in this country and America and Sweden are hoping that it will not be long before the Committee set up to consider the best form such memorial should take, will come to some decision. The Swedish Ambassador's remarks are most opportune. Sir Lawrence paid many visits to Sweden, and each time came back full of admiration of the renaissance of the arts in that country. He regarded the Town Hall at Stockholm as perhaps the most typically interesting of modern buildings.

High Buildings.—A representative of the American Institute of Steel Construction has been suggesting to Londoners that higher buildings would be helpful in solving the traffic problem. As the question of increasing the height of London buildings is a matter of serious discussion for the moment, it is interesting to quote from a letter we have received from the representative of the engineering services of this Institute:—

"With reference to the situation in London, there can be no comparison between, say, New York and London, as the conditions are so totally different. We here have been forced into what we are doing in the way of tall buildings with, I believe, excellent results for the most part. As for London's congestion—has not London been 'congested' since before the days of the Romans? It is all a relative matter. Although very undesirable from many points of view to introduce skyscrapers to London, there may really be something worth while in their use in the manufacturing and congested tenement districts for commercial use without in any way harming the London of Sir Christopher Wren. London with skyscrapers which would destroy the character of the city would be another and rather un-



Sign of "The George and Dragon" at West Wycombe.



Sign of "The George and Dragon" West Wycombe.

pleasant city. However, a cleaning up of the unlovely slums and manufacturing districts would surely be a betterment in every way, if such cleaning up were not to interfere with those things which should be preserved."

Mr. Warren S. Thompson, in a very interesting article on "The Future of the Large City," in Mr. Mencken's very live journal "The American Mercury," has a larger vision, and looks to science in the future to make our congested cities unnecessary. He says:—

"I believe we now have in electricity and the gas-engine agencies capable of effecting a complete reorganisation of our economic structure when we come to use them fully; and of course, if and when this economic reorganisation is undertaken, it will mean a redistribution of population and a reconstruction of our whole social order. People go where jobs are. Of this there can be no doubt. If, for example, the great life insurance companies of New York were to decide to move three-fourths of their workers out of New York City, as they no doubt could do with profit to all concerned, by reorganising their business structure and by making full use of electric and airplane communication, there is little doubt that the building of more skyscrapers and subways in New York could be postponed for a few years or perhaps forever. Besides, once it was made clear by actual demonstration that our huddling of enormous numbers of workers in huge offices in great cities is neither good economics nor good social policy, thousands of other smaller businesses would follow the lead of the great companies and seek out locations which would be more advantageous for them, both from the standpoint of getting work done and from the standpoint of the welfare of their workers."

The Preservation of Rural Amenities.—The Society has recently received several donations for the preservation of West Wycombe from Englishmen living abroad and in out-lying portions of the Empire. It is particularly gratifying to receive such evidence of appreciation from English people who wish to be able to recognise, when they return to our shores, the English countryside as they remembered it. A fellow of the Society resident in Chile writes:—

"Your campaign for the preservation of the amenities—not to say the decencies—of the English country is most commendable. Here, on this coast, not even the cemeteries have escaped the blatant vulgarity of commercial advertisement. There was an "ad" for a brand of tea all along the east wall of the most prominent graveyard, situated on one of the Valparaiso hills—but it may have been removed since last I saw it."

West Wycombe.—Pending decisions that have to be taken before the general work of reparation in West Wycombe starts in earnest, it was thought advisable to brighten up the village by restoring the sign over "The George and Dragon." This blackened sign was found to be made of solid lead, and revealed, when cleaned, the two very interesting pictures which we illustrate. We suggest the possibility of this being early 18th century, and the work of a local artist with considerable sense of composition. The painting has only been cleaned and judiciously touched up by Mr. Clive Gardiner. The disclosure of our English Patron Saint in such activity should encourage the county of Buckingham, and the

Fellows of the Royal Society of Arts into real enthusiasm for making this little English medieval village a live industrial centre. May we again implore the local authorities to give this village facilities for drainage that it needs so badly, and which they are under obligation to the Ministry of Health to put in hand?

Advertising.—The Royal Society of Art's efforts to stem the outcrop of irresponsible advertising have added to the gaiety of the advertising world. A humourist suggests the need of a new Society to be called "The Anti-Advertising League, 1930." "No member shall buy, use, nor in any way derive benefit from any article or service that, directly or indirectly, is contaminated by advertising." Having established these admirable rules for the members of this new Society, the following reminder is given them in a footnote that "Advertising leads you to the good things of life." Obviously, the greater attention that is drawn to good things by advertisement the better, but a sense of irritation only is set up for even goods things by disturbing the beauty of rural and urban England with disorderly and strident advertising.

St. John's College.—We understand that the Battersea Town Council are holding their hand in regard to the fine house attributed to Sir Christopher Wren, with a view of seeing if this can be with advantage incorporated in an architectural scheme in connection with their housing proposals on this site. In these circumstances, we hold over the plan which it was proposed to publish in this week's Journal.

PROCEEDINGS OF THE SOCIETY

CANTOR LECTURES

THREE MASTER ETCHERS: REMBRANDT, MERYON, WHISTLER

BY HAROLD J. L. WRIGHT

LECTURE I.—*Delivered January 20th, 1930*

THE ETCHINGS OF REMBRANDT VAN RIJN (1606-1669)

In the register of deaths kept in the Westerkerk in Amsterdam there is, under the date Tuesday, October 8th, 1669, the simple entry: "Rembrandt van Rijn, painter, on the Roozegraft, opposite the Doolhof. Leaves two children." That is terse enough. Yet it does not contain all the truth, for Rembrandt's name has been handed down, not by those two children but by his works—his paintings, his drawings and his etchings.

It is with the latter we are here concerned. Though, like his drawings, they are

less widely known than his paintings, his fame rests just as firmly on them, and they have been quite as keenly studied, criticised, catalogued and championed. Indeed, it would be impossible to estimate his position in art without a close acquaintance with them. Not few are the difficulties besetting the student of Rembrandt's etchings, one of the chief being the continued absence of a definitive catalogue, a difficulty that may, we fear, long remain, since a number of the lesser etchings hitherto accepted as Rembrandt's work and purporting to be signed by him have come to be doubted, and the question of their real authorship seems unlikely now to be settled readily. The number of plates actually etched by Rembrandt is believed by Mr. A. M. Hind of the British Museum to be just less than three hundred, and he speaks with authority, his researches having been very extensive. His masterly catalogue, originally published in 1912, revised and re-written in 1923, is generally recognised to-day as the best extant, though Mr. Hind himself would not, cannot, even now claim finality for it.

After the publication of the first *catalogue raisonné* of Rembrandt's etchings—that of Gersaint, issued in Paris in 1751 and describing 341 plates—further study of the prints was undertaken by various admirers, and, as a result, several fresh catalogues have appeared, all possessing certain merit and all more or less complementary. The best known—for I do not mention all—are those of Bartsch (Vienna 1797, admitting 375 plates as authentic), Wilson (London 1836), Middleton-Wake (London 1878, accepting 329 plates as authentic—the only catalogue describing also the deceptive *copies* of Rembrandt's etchings), Blanc (Paris, 1880), Dutuit (Paris, 1881/1884), Rovinski (St. Petersburg, 1890), Von Seidlitz (Leipzig, 1894, revised and reissued by Professor Hans Singer in 1922, admitting rather less than 270 plates as authentic), and that of Mr. Hind already mentioned. Of these the most widely used to-day are those of Bartsch, Middleton, Rovinski, Von Seidlitz and Hind. The particular virtues of Mr. Hind's catalogue are the chronological arrangement he has attempted—an arrangement of which the importance was first stressed by Seymour Haden in 1877—the classification and discussion of doubtful plates, and the elimination of such plates as are now generally believed to be by other hands than Rembrandt's.

All these catalogues are themselves tributes to the high esteem in which Rembrandt's etchings have been held, at least from the early eighteenth century onwards. It is difficult to ascertain exactly in what esteem the etchings were held by his contemporaries, but we know that they were bought, sold, and exchanged, whilst here and there we meet tributes to their merit. An impression of his famous plate "Christ healing the Sick" was soon valued, it is said, at auction, at 100 guilders (about twenty pounds in our present money), and this has therefore, ever since been known as "The Hundred Guilder Plate." Whether, like his paintings, Rembrandt's etchings passed under a shadow for a time, we do not know. Of several, for some reason or another, very few proofs have come down to us, which does not seem to indicate a very brisk contemporary demand. People often ask how many proofs of this or the other plate exist. We really do not know,

and until a world-wide census of Rembrandt's etchings is undertaken, we shall not know. At present our only means of judging how many impressions exist of any given plate is by the number of times impressions of it appear in the market, and even then, in estimating, the possibility that some of these may be the same items turning up again has always to be taken into account.

Rembrandt is the greatest of all the master-etchers the world has been given until now. Indeed, it is difficult to believe that his high position can ever be shaken, so complete was his achievement, so amazing his knowledge of the medium, so perfect his technique. When we think of etching we think automatically of him, as we do of Dürer when engraving is mentioned. It would interest students greatly to know how, when, and where Rembrandt first began etching. The medium had only been in use about a hundred years when he took it up, and no consummate masters of this art had as yet declared themselves. There were the etchings of the Hopfer brothers, mostly copies of other artists' engravings or drawings; Dürer had produced, experiment-wise, half-a-dozen remarkable etchings on iron; Albrecht Altdorfer, Augustin Hirschvogel and Hans Sebald Lautensack, working in Germany in the first half of the 16th Century, had produced some notable and charming plates, chiefly landscapes; Jost Amman, in the second half, ornament prints, title-pages and illustrations. Possibly it was from Italy that the influences came which directed Rembrandt's attention to etching, for Italian painting was much applauded in his time, and many of his contemporaries made the journey to Italy to study, admire, and copy the works of the great Italian Masters, though Rembrandt steadily refused to follow them. Italy certainly could show numerous etchings which may have attracted Rembrandt, those of Parmigiano, for instance, or of Schiavone, or of Baroccio, many of which possess distinct vitality. In his own country, Esaias and Jan van de Velde were his immediate predecessors, and though their etchings are somewhat stiff in treatment, their subjects ranged over a wide field, from the Scriptures to landscape; it is not at all impossible that Rembrandt had met these artists and studied their works. We must mention also Willem Buytewech and especially Hercules Seghers and Pieter Lastman. It will be admitted, however, that Rembrandt received no great legacy in the conventions of etching, and our search for the origin of his determination to experiment with the medium finds little satisfaction.

Rembrandt was born at Leyden, it is believed in 1606, though some authorities say in 1607, and was the son of a miller Harmen Gerritz van Rijn. He was thus two years younger than Milton, and Shakespeare died when Rembrandt was ten. He entered Leyden University in 1620, but left before the end of the year, and induced his parents to allow him to take up painting, his first master being Jacob van Swanenburgh of Leyden with whom he worked about three years. Later, about 1623 or 1624, he studied under Pieter Lastman in Amsterdam, but apparently only for the space of six months, retiring to Leyden, as it is said he disagreed with the attempts that were being made to Italianise all the work of the period, and had rejected a proposition that he should visit Italy to study there. His striking

independence was thus asserted early. Throughout his whole life he was content with such subjects and landscape as lay to hand, and, as far as we know, never left Holland, though there is a story of a visit to England (to Hull) about 1661.

He removed from Leyden to Amsterdam about the end of 1631, and married Saskia van Ulenburch in June, 1634. Of this union there were two daughters and two sons, only one of the four, Titus, the younger son, surviving infancy. Saskia died in 1642, and her decease gradually involved Rembrandt in many lawsuits over her estate, which brought about his eventual bankruptcy in 1656. At least two liaisons followed Saskia's death, that with Hendrickje Stoffels ending in marriage. Hendrickje died before 1664, Rembrandt's son Titus in 1668, whilst Rembrandt himself died in 1669.

Such, briefly, are the facts of his life. He knew more than the ordinary share of trouble, financial and domestic, or of disappointment in his profession, and we picture him in his closing years a saddened, weary man, as indeed we may see him in those final portraits of himself of which both the National Gallery and the Louvre possess magnificent examples. Yet we may believe that he found in his painting and etching a solace amid his many troubles, and picture him in the solitude of his room bending over his plates with loving regard, tender emotion and quiet joy, turning for consolation to the great story of the New Testament and to the histories of the saints in the Old. He would have agreed with Camille Pissarro, who wrote: "Work is a marvellous regulator of health, both moral and physical. I forget all sorrows in the joy of work. Suffering has no hold save on the idle."

But it is time we turned to the etchings, and let them speak for themselves of the genius of the great master. The selection we shall review has been made with care and includes examples of almost every phase of his many-sided work, excluding, as far as possible, all plates no longer assigned to him. We shall begin with some of the beggar subjects, continue with the illustrations of Biblical subjects, pass then to the landscapes, and end with the portraits and last etchings. The examples in each of these sections will be arranged as nearly as we know chronologically, in order that, if possible, some idea of the progress of his art may be obtained. Rembrandt's etchings will be found to group themselves into three periods, the first from 1628 to 1640, where the pure etched line predominates; the second, from 1640 to 1650, where touches of drypoint are used to enrich the etched basis of the plates; and the third, from 1651 onwards, where drypoint plays a great part on the plates, and where chiaroscuro effects are more and more common, resembling indeed those of his later paintings, and marching, as it were, with them.

First, then, the beggars. There is no doubt that when Rembrandt left Pieter Lastman and returned to Leyden to set up on his own, he spent much time sketching the man in the street, in addition to drawing the portraits of his parents and friends. All his life his interest was to be chiefly in the figure and portrait, and he certainly began early to learn to draw them. We cannot help feeling he must have been a great lover of humanity, so intimate are his studies of his fellows,



The Rat Catcher

so keen his perception of their essential features. These early etchings of beggars show clearly Rembrandt's power merely by the main outlines to suggest the weight and form of a figure. The woman especially in *Beggar man and woman coming from behind a bank* (1630), (H 13)* and the single figure in *Beggar in high cap, standing leaning on a stick* (1630?) (H 15) show this clearly. These plates possess all the qualities of a pen sketch, indeed it is etchings like these which make the man in the street believe they are a kind of pen-drawing. Forain said to me once that the most difficult thing in painting or drawing was to keep the idea of the sketch, not to elaborate too much. Seymour Haden said something of the

* References to Mr A. M. Hind's catalogue are alone given here since that catalogue is illustrated and generally accessible.

same kind when he urged the necessity of conserving the essential lines of a plate, whilst Ruskin asserted that all good etchings are done with few lines. In the *Beggar seated on a hillock* (1630) (H.11) we find a little more elaboration, as though Rembrandt were now gaining confidence, until, in the *Rat Catcher* (H.97), and in the *Beggars at the door of a house* (1648) (H.233), although we see him still retaining his love of an outlined figure, we find almost perfect shading, nothing being carried too far; the contrasts of light and shade in the latter are most cleverly managed, and the weight of the figures admirably given, to say nothing of the arresting depiction of the countenances and gaze of both the donor of the alms and the recipients of it. Notice the affection of Rembrandt for a figure placed with its back to the spectator; over and over again we meet such, and it is almost possible to read the thoughts of these personages, so masterly is the presentation. Sir Charles Holmes considers that constructive drawing could go no further than it does in this plate.

Of the numerous etchings of beggar subjects hitherto always attributed to Rembrandt only about thirty are now believed to be by him. It is around these beggar plates, of 1630 and 1631 chiefly, that criticism has raged most fiercely. Many of them are, in any case, insignificant, and Rembrandt's fame fortunately does not rest on them, so they need not detain us; after all, as Wedmore said: "The critic who is busy with doubtful attributions is busy with the second-rate."

It is a natural step from Rembrandt's etchings of beggars to those illustrating the Scriptures, in which he undoubtedly used his sketches of beggars and street-folk. Not perhaps at first, whilst he was throwing off the influences of Lastman or of his young friend and fellow-student, Jan Lievens, and even of Rubens, for we find in *The Raising of Lazarus* (the larger plate) of 1632 (H.96), a composition resembling his painting of that period, and almost certainly based upon it. The plate has dramatic force, but lacks the spiritual significance of his later works. Some doubt has been expressed as to whether it is all Rembrandt's handiwork, but if it is not, it is most likely because it was reworked subsequently by later hands, as happened with several of Rembrandt's plates which survived him.

Of the *Descent from the Cross* (H.102 and 103) there are two plates of this period, the first unfinished, having apparently failed in the biting, and the second, highly finished, perhaps too highly for Rembrandt lovers. This plate also has been keenly scrutinised for the traces of Rembrandt's own handiwork, as it has obviously been worked over with the graver, in its later states especially. As these later states bear on them the names of printsellers of the time it would seem that there was a good sale for this plate, and probably, therefore, many impressions of it exist. Rembrandt's painting of this subject is in Munich.

We have as yet seen no landscape work in any of the plates, but in *The Angel appearing to the Shepherds* (H.120) we get a foretaste of the landscape Rembrandt was to render more convincingly later. Here again we still feel his dependence on the painting, and witness a striving for dramatic effect rather than that simplicity and directness of appeal he afterwards developed. We need not stay to discuss the

Christ at Emmaus (the smaller plate) of 1634 (H.121) delightful as it is, for we shall be more arrested by the larger version made by him twenty years later. Nor need we dwell upon the *Christ and the Woman at the Well* (1634) (H.122), which brings the scene vividly and memorably before us, or the *Christ and the Money Changers* (1635) (H.126)—a somewhat crowded plate—except to remind ourselves that the influence of Rubens is still marked, and that the figure of Christ in the latter plate is borrowed from one of Dürer's engravings, whilst the Venetian painters also had evidently possessed some attraction for Rembrandt. Our remarks as to the *Descent from the Cross* apply equally to the *Christ shown to the People* (1635/36) (*the large, upright plate*) (H.143), which has been much discussed but is now generally accepted. There is a *grisaille* of this subject in the National Gallery. A very different affair is the *Return of the Prodigal Son* (1636) (H.147). Here we have light, and air, and freedom of handling; the subject has life and the human element pervades it. The central personages are perhaps ill-favoured, but the subject has never been treated with deeper imaginative sympathy or more appealingly.

We come now to one of Rembrandt's greatest works—the greatest, Hamerton was inclined to think—*The Death of the Virgin*, etched in 1639 (H.161). The solemnity of the scene is most touchingly rendered; every figure possesses individuality and well repays study. This plate, as one critic has said, is a sort of pictorial oratorio. Rembrandt seems to make us share in the impressive and solemn scene, and his power in this respect is nowhere better shown. Yet this print, one of his acknowledged masterpieces, even to-day is neither the most difficult to obtain nor one of the most costly— a hundred pounds or so, for a fine impression. A delightful sketch is the *Baptism of the Eunuch*, which is dated 1641 (H.182). In it we see traces of the influence of those Persian drawings of which Rembrandt is known to have seen examples even if he did not actually possess some; and there is a hint, again, of the influence of Rubens. In the *Raising of Lazarus (the smaller plate)*, dated 1642 (H.198), we have a definite landmark in Rembrandt's career, and one of his most successful plates. There is just sufficient mystery in it; the figures fuse naturally into the general scheme, the contrasts of light and shade are excellent, and the etching, though small in size, is big in design, and a great favourite.

The *Christ carried to the Tomb*, dating from about 1645 (H.215), is another most moving plate. The whole tragedy of Christ's burial is told simply but convincingly, and the presentation is such a contrast to those majestic but somewhat theatrical depictions of this scene by the great Italian Masters. The simple-hearted affectionate followers are unconscious that they form the grandest funeral procession of all time.

We come now to the most famous of Rembrandt's etchings, indeed the most famous etching by any master, the *Christ healing the Sick*, known popularly, as we have seen, as the "Hundred Guilder" plate, done about 1649 it is thought (H.236). It has always been greatly admired; indeed so deep was its appeal to

one collector that it is said he caused it to be hung where he could see it as he lay dying. We will not attempt here to dilate on its many beauties, but will be content with drawing attention to its marvellous execution, slowly elaborated as it seems to have been from such outlined figures as we see on the left in it. It is like a cathedral, masking in its completed ensemble the problems of mechanics and equilibrium that have had to be solved during its construction. In this plate all the known methods of etching are employed, from the simple outline to the most subtle gradations of tone by the use of the closest of cross-hatching, as an enlargement of the central portion of the plate clearly shows. The plate was reworked and reprinted by Captain Baillie, a hundred years ago, and finally cut into three pieces.

Very different is the *Christ appearing to his Disciples* ("Doubting Thomas" as it is sometimes called), dated 1650 (H.237). Surely here Rembrandt is the forerunner of Turner and of the Impressionists of yesterday. As by a sudden flash of supernatural illumination the presence of the Christ is at last realised, and all doubt of His Divinity is dispelled from the minds of the hesitant band. *The Blindness of Tobit*, dated 1651 (H.252), is another masterpiece of straightforward drawing, pathetic and attractive. Other plates in the following year are akin to it, the *Christ among the Doctors (the larger, oblong plate)* (H.257), for instance—"Have ever cunning, stupidity, senility and fanaticism been more concisely portrayed than here?" asks Sir Charles Holmes—and the *David at Prayer* (H.258), although the latter plate is more elaborated, as is also the *Christ preaching* (H.256), where we see Rembrandt beginning to use the drypoint to enrich the tones here and there. The popularity of this plate almost equals that of the "Christ healing the sick." One collector of our acquaintance who owned a very beautiful impression of it, used to keep it covered with a silk handkerchief all the week, only uncovering it on Sundays when he was wont to place it upright upon a chair, spend some considerable time kneeling in adoration of its many beauties, and allow its great appeal to evoke in him afresh his reverence for Our Lord's teaching. In this, and in the *Adoration of the Shepherds, a night piece* (H.255), we have the beginnings of Rembrandt's final manner, and of those amazing "Rembrandtesque" effects, as they are so often called.

Two of his greatest plates are *The Three Crosses* (H.270), and the *Christ shown to the People (the oblong plate)* (H.271), the former done in 1653, the latter in 1655. Both are large plates. *The Three Crosses* is done in Rembrandt's broad and rapid manner, and must be judged synthetically. There is some exaggerated drawing in it, but this is soon forgotten in the majesty and drama of the scene, and it remains one of Rembrandt's supreme utterances. There are five "states" of it. In these successive states the scene is more and more darkened in an attempt to bring out the idea of tragic catastrophe. Opinion is divided as to their relative merits and effectiveness. On the whole it would seem as though the first state were the most successful, being simpler, clearer, better lit, and less forced. It is the rarest state, too, only eight or nine proofs of it being known.



The Three Crosses (1st State).

Of the *Christ presented to the People* there are seven states. In the first four there is a crowd of figures before the tribune; these figures were replaced in the fifth and later states by two dark arched openings in the base of the tribune. The plate bears some appearance of having remained unfinished, and we may not be wrong in believing Rembrandt intended to shade it all over as he has begun to do at the left side. This would undoubtedly have greatly enriched the general effect, but we should have lost the pleasure we now derive from the study of the many outlined figures. The plate was suggested by an engraving of the same subject by Lucas van Leyden, for whose works Rembrandt had a great admiration, owning a collection of them; for Rembrandt was a great collector, often paying high sums at one forbidding bid to acquire pictures and drawings he coveted.

We can do no more than review rapidly the remaining examples of his Scriptural illustrations that we have selected. There are *The Flight into Egypt* (*The Holy Family crossing a brook*) (H.276); the *Presentation in the Temple* (H.279)—with its effects of flashing glittering colour reminding us of Rembrandt's paintings of this period; the *Return from the Temple* (H.278); the *Descent from the*

Cross (Torchlight) (H.280); the *Entombment* (H.281)—in its two states, the first in open line and the second printed with much tone; and the *Christ at Emmaus (the larger plate)* (H.282). All these date from 1654.

In *Abraham entertaining the Angels* (H.286) Rembrandt reverts for a moment to his open line effects, and reminds us again of his paraphrases and copies of Persian drawings, several of which studies are to be seen in the British Museum.

The Agony in the Garden (H.293), done about 1657 and therefore one of his last plates, is a complete masterpiece. It may possibly have been intended to form one of a series of "Passion" subjects, for which he received a commission just prior to his death. Sir D. Y. Cameron, who owns Rembrandt's drawing of this subject, has a great predilection for this beautiful and moving plate, and once expressed the opinion to a well-known print-collector that any home might be considered amply furnished pictorially, did it but boast a fine impression of this wonderful little plate. It is interesting and pathetic to recall that, about the time this was etched, Rembrandt himself was no doubt suffering much mental agony, having been made bankrupt and penniless, severed from all the treasures of art he had been at such pains to collect and in which he had taken such delight. No wonder if Gethsemane were in his mind!

We pass now to Rembrandt's landscape etchings. These again we shall not need to dwell upon individually, beautiful as they are, for they are fairly well known and do not present such great variety of treatment as his Scriptural plates. Their effect is of black on white, and the line is given its full value. Rembrandt seems to have taken up landscape etching about 1640; the majority of his landscape plates were produced between 1650 and 1652. The earliest date on any of them is 1641; they number about 27 in all, and may possibly have been made by him during interludes amid his more usual work. Amongst the best are the *View of Amsterdam* (about 1640) (H.176), a little plate that is filled with air and sun; the *Cottage and Dutch Haybarn* (1641) (H.177), in which we feel the quiet of the fields and "all the live murmur of a summer's day;" *The Mill* (1641) (H.179), long thought to be his father's mill; *The Three Trees* (1643) (H.205)—the most famous landscape etching in the world, full of bold dramatic intensity, approaching a painting in its completeness; *Six's Bridge* (1645) (H.209), perfectly amazing in its summary swiftness, its bold clear line, its rightness of placing, and its suggestion of air and light—the story goes that it was needed by Rembrandt whilst mustard was being fetched from a neighbouring village for use at his host Six's luncheon table, this commodity having been forgotten by a careless servant; *The Flock of Sheep* (1650) (H.241); the *Landscape with trees, farm buildings and a tower* (about 1650) (H.244), which Wedmore used to say was the beginning of all modern landscape etching; the colourful and compact *Landscape with a Square Tower* (1650) (H.245); the *Goldweaver's Field* (1651) (H.249), by many considered the most accomplished of all; the vigorous *Sportsman and Dogs* (about 1653) (H.265); and the *Road beside a Canal* (about 1652) (H.264). These landscapes, views of the environs of Amsterdam where



Landscape with Cottage and Hay Barn.

he made many sketches such as those now in the Duke of Devonshire's collection at Chatsworth, are handled with consummate skill, and show, as a rule, masterly economy of line. Small wonder that these gems of reticent perfection have been the principal study of all landscape etchers since, or that they have remained unequalled in their beauty, freshness, and charm. Rembrandt is indeed the paragon of landscape etchers. As Mr. Laurence Binyon says, "We can walk in imagination into these little landscapes, and not only do we breathe an infinite air, but we are sure of every step"; or as Lippmann says: "So complete is Rembrandt's command of his craft, so delicate his perception of tone, so convincing his perspective, that we forget we have only a black and white before our eyes; the prints seem to express everything that a finished painting in colours could supply."

But we must reluctantly leave them, and turn to the portraits and the plates akin to portraits for which many students and collectors express a preference. The point of view of these collectors will easily be understood as we pass these plates in review, though we may not all agree in preferring them entirely to Rembrandt's other etchings.

Rembrandt's first dated portrait etching is that of *his mother, the bust only, facing half right* (H.1). What a tribute it is, not only to his youthful skill, but also to his filial affection! It is usually spoken of as his first etching, as the date upon it (1628) is the earliest on any of his plates, but it is so splendidly executed, it is so accomplished, that it is difficult to believe it was his first experiment in the medium, and it is always possible that documentary evidence may one day be forthcoming to show that other plates, at present placed later in the catalogues, in reality preceded this. In any event it remains one of his most delightful little etchings and is a great favourite.

Its popularity is only equalled by his *Portrait of his mother, seated at a table, facing right* (about 1631) (H.52), which is as complete as Rembrandt's best paintings of this period. The old lady has an air *grande dame*, and was evidently a woman of character, confident, reflective; there was nothing of the commonplace about her, according to these etchings by her illustrious son.

Very successful and arresting is the *Old man seated, wearing fur cap and velvet cloak* (1632) (H.92), which could, in a way, be regarded as a companion plate to the last, so full is it of richness and character.

Rembrandt was very fond of drawing his own portrait in all kinds of expressions and garbs. There is one such portrait known as *Rembrandt with raised sabre* (1634) (H.109), in which the face is etched in masterly fashion again, and another of the same year, *Rembrandt with plumed cap and lowered sabre* (H.110), which, in its early state before the plate was reduced to a small oval, is extremely rare, only three impressions being known (British Museum; Amsterdam; and Paris). *The Great Jewish Bride* (1635) (H.127), so-called to distinguish it from a smaller plate of a similar subject, is dated 1635, and though perhaps not as accomplished as some of the other portraits, we can agree that it is a very notable piece of work, and remember that it has its admirers. In the *Fourth Oriental Head* (or the

Young Man in Mezzetin Cap) (date, presumed, 1635) (H.134), we have another of Rembrandt's masterpieces, parody though it be of a similar plate by his friend Jan Lievens. This and the three other plates known as "Oriental Heads," so named on account of the costumes rather than the features, may have been mere caprices on the part of Rembrandt, or the result of a wager that he could show his friend how his work might be improved without drastic alteration of design or treatment.

In one small plate of 1636 we see *Rembrandt and his wife Saskia* (H.144). It is perhaps not one of his most successful plates. The hand is weakly drawn, as it is sometimes in Rembrandt's etchings. Saskia's figure is well etched, better on the whole than Rembrandt's. The *Bearded Man wearing a velvet cap with jewelled clasp* of the following year (H.150), is a brilliant affair, full of rich colour. There is a certain liveliness in the eyes, and the pensive semi-sceptical look makes the plate very arresting. Even finer is the *Young man meditating* of the same year (H.151). This is indeed one of the gems, reminding us at times of Holbein, and contradicting Ruskin's statement that "You cannot etch a girl, nor, unless in his old age, or except with very partial rendering, a gentleman." Was Rembrandt more successful with his portraits of men than with those of women? Certainly in plates like the *Sketches of three female heads* (H.153), we have brilliant work, and again a fine rendering of expressions. These are doubtless sketches of Saskia. The *Rembrandt wearing cap and feather* (1638) (H.156), was doubted by one authority, Vosmaer, but certainly without reason, for the rendering of the features alone could not have been as successfully accomplished by any of Rembrandt's contemporaries.

There is more reason to doubt whether the whole of the work in the *Uytendogaert (The Goldweigher)* (1639) (H.167) is by Rembrandt. General opinion to-day inclines to the belief that the work was outlined by Rembrandt, the head and shoulders of the sitter being carried to completion by the master, and the subsidiary work by a pupil or pupils (Bol perhaps). The original plate was, at the close of the eighteenth century, in the possession of Captain Baillie, who also made a good *copy*, of which impressions are constantly seen. The original plate subsequently disappeared for many years, but was eventually acquired by a London copper-plate-printer amongst some old copper plates he was purchasing. Impressions of it were taken, and the plate was eventually sold at Christie's in 1929; it is now in an American private collection. Whilst speaking of Rembrandt's copper plates we may mention that a number of them still exist, seventy-nine being in a private collection in Paris. These plates, of course, are mostly very worn, and impressions printed from them to-day would be practically worthless, so faint and grey would the work in them appear. We must hope that they will soon find a permanent resting-place in a Museum, which would by common consent be their ideal home.

Rembrandt's portrait of himself, known as *Rembrandt leaning on a stone sill* (1639) (H.168), is one of his best. The motive and pose were probably suggested

by Raphael's portrait of Baldassare Castiglione (now in the Louvre) of which it is known he made a sketch when the original picture was sold in Amsterdam in the year this etching was done.

In 1642, as we have seen, Saskia died. Though it is not dated we find amongst Rembrandt's etchings a tiny plate which Blanc suggested is a study of Saskia during her last illness and is hence frequently referred to as "The Sick Saskia" or *The Dying Saskia* (H.196). It is a tender sketch, full of pathos, and is, moreover, one of the rarest of Rembrandt's etchings.

Somewhere about 1642 for one reason or another, Rembrandt's general style in these portrait plates seems to have changed from a light manner to a dark, to a feeling after chiaroscuro. Was he seeking to approximate them to the richness of his oil portraits, or was he perhaps endeavouring to produce in etching something of the effect of the mezzotints which were beginning to be seen about then? One often inclines to the latter view, since Ludwig von Siegen, the inventor of the mezzotint process, was settled in Amsterdam in 1641. In August, 1642, Von Siegen wrote to the Landgrave of Hesse recording his discovery, and his first dated mezzotint is one of 1642. Certainly in a plate like the highly finished *Portrait of Jan Six* (H.228) we cannot help thinking of mezzotint effects, and it is dated 1647. It is unquestionably Rembrandt's masterpiece, the acme of high finish, and was evidently intended to be the *tour de force* we see it. This was a private plate, done for the Six family in Amsterdam; the plate is still in their possession. From time to time some of the proofs they owned have been sold; in 1928 one of the few existing proofs of the rare second state was sold at auction by the family in Amsterdam, and purchased by Messrs. Colnaghi for the record sum of £8,200—a record price for any print yet sold at auction. It is now in a private collection in London.

In 1648 Rembrandt portrays himself again in the plate known as *Rembrandt drawing beside an open window*, in which, in the later state, we get a glimpse of a landscape (H.229). In the early states the eyes are keen and the features delicately modelled, but this keenness and delicacy is lost, to a certain extent, in the latter states, which makes one doubt if all the additional work in these is by Rembrandt himself.

An exception to the dark manner is the superb portrait of *Clement de Jonghe* (1651) (H.251), a well-known printseller and publisher who died in 1679 and in the inventory of whose print-stock we find the earliest list of any notable number of Rembrandt's etchings. This plate is almost entirely in clear open line, and is one of the most admired of the portraits, closely resembling in execution that of the *Blind Tobit* of the same year. This portrait of Clement de Jonghe held Wedmore as it did Sir Henry Irving; Whistler wrote on a proof of it, formerly in Mr. J. H. Wrenn's collection in Chicago, and now in the Art Institute there:—"Without flaw. Beautiful as a Greek marble or a canvas by Tintoret, a masterpiece in all its elements—beyond which there is nothing."

We pass more rapidly, though still carefully, over the well-known portrait of



Burgomaste Jan Six.

Dr. Faustus (1652) (H.260), which is considered one of the most perfect of Rembrandt's etched inventions; the *Old Haaring* (1655) (H.287), who was connected with the Bankruptcy Court in Amsterdam, and is said to have conducted the sale of Rembrandt's effects when he was made bankrupt; the *Young Haaring* (1655) (H.288), son of the former, which is again wonderful in colour, texture, and character, fit company for any of Rembrandt's finest portraits in oils; the *Dr. Arnold Tholinx* (1656) (H.289) one of the rarest of all the etched

portraits, only about eight impressions being known in all. (For one of the three known impressions of the first state of this—the other two being in the British Museum and in Baron Edmond Rothschild's collection in Paris—Messrs. Colnaghi had to pay what was at that time a record sum of £3,750 at the Edward Rudge sale at Christie's in November, 1924. This proof is now in an American private collection.) Finally the *Jan Lutma, a goldsmith* (1656) (H.290), of which the rare first state is before the addition of the window in the background. All these great plates show an intense insight into character, and a firmness of handling unexcelled in any of Rembrandt's other work. We see in them again those technical preferences and that psychological excellence which had combined to make his Biblical compositions perfect things of their kind. Rembrandt's strength lay in his respect for the wisdom of maturity and the dignity of declining years. No artist ever depicted more gently the slow approaches of senility, or the beauty and pathos of age.

A glance at a few plates of various subjects, and our review of this great master's etched work will be concluded. There is *The Shell*, etched in 1650 (H.248), a most brilliant piece of still-life etching, which nevertheless Ruskin dismisses as "mere child's play compared with the disciplined light and shade of Italian masters," forgetting, in his dislike of etching as what he called "the very refuge and mark of sentimental uncertainty and vigorous ignorance, an indolent and blundering method at the best" that this is an *etching*, not a *painting*. In the *St. Jerome in an Italian Landscape* (done about 1653) (H.267) we have a landscape background obviously inspired by the Italian masters, possibly by Titian or Campagnola. Indeed it is asserted that it was copied by Rembrandt from a drawing once in Dr. Wellesley's collection.

Rembrandt etched a few illustrations for books. There is, for instance, the *Medea: or the Marriage of Jason and Creusa* (1648) (H.235), designed to illustrate a tragedy of Medea written by Rembrandt's friend and patron Jan Six, published in Amsterdam in 1648, a somewhat rare book. This plate is interesting to students of Rembrandt's treatment of architecture, and was a great favourite in the eighteenth century, no gentleman's collection being complete, it was thought, without an example of both the early state before the crown was added to the head of the enthroned Juno, and of the later state with this addition.

One of the plates most resembling Rembrandt's pen drawings is the *Large plate of a Lion Hunt* (1641) (H.181), though it is possibly based on one of Antonio Tempesta's etchings. It is one of three similar hunting subjects. Reminiscent of Holbein's famous "Dance of Death" series is the *Death appearing to a young couple from an open grave* (1639) (H.165), in which the treatment reminds us of that in the "Death of the Virgin" of the same year.

Both at the commencement of his career and again towards its close, Rembrandt made a few studies of the nude, showing as a rule a somewhat strange preference for coarse types. The *Diana bathing*, done about 1631 (H.42), is a skilful plate with some delicate work in places, but it does not compare with the mastery

shown in Rembrandt's last *dated* plate (not perhaps his last plate, although we have no direct evidence to the contrary) the *Woman with the Arrow* dated 1661 (H.303). A study for this is in the British Museum. Another nude study *The artist drawing from a model* (dating from about 1648) (H.231), is interesting to students of Rembrandt's method of working.

We close our review with the plate known as *The Phoenix* (1658) (H.295). It is a noble design worthy of the greatest sculptors. The meaning and intention of the plate are somewhat obscure; it is generally believed to refer to political or national events of the time or perhaps to Rembrandt's bankruptcy, in which case it may be regarded as Rembrandt's attempt to record his belief that his fame would yet rise from the ashes of his failure.

His fame most certainly has risen since then, and the appreciation of his etchings, as of all his work, was never keener than now. The prices paid for his greatest etchings are higher in proportion than for any other etcher's works, yet the collecting of them goes on from generation to generation, though amid increasing difficulties, for it would seem hardly possible that there are still in existence any unknown collections of them, and consequently it is only as known impressions change hands that the modern collector stands a chance of securing them. Despite these difficulties several excellent collections have been made in recent years—at some cost, admittedly—by both European and American collectors, and there is no need yet for any collector to be without a few satisfactory examples of the master's etchings. The serious student will find excellent collections in most of the great European print-rooms. That in the British Museum is the best; next to it come those in Amsterdam (Rijksmuseum and Rembrandt House), Haarlem, Paris (Bibliothèque Nationale and Dutuit), Berlin, Vienna, Petrograd, Oxford, Cambridge and Boston, whilst the collections of Baron Edmond Rothschild in Paris, Mr. J. de Bruijn in Switzerland, Mr. Leonard Gow in Scotland, and Mr. Pierpont Morgan in New York, take rank with these.

It will have been evident from all we have seen, and from our memory also of his great series of drawings and of the noble array of paintings, that Rembrandt was an inveterate worker. His energy, as a young man especially, was remarked upon by his contemporaries, and it is clear that he devoted himself constantly, passionately, determinedly to his art. He realised that:—

“ The heights by great men reached and kept
Were not attained by sudden flight;
But they, while their companions slept,
Were toiling upward in the night.”

As a result of that devotion we have inherited a body of work which is a source of infinite delight, unexcelled by that of any other painter or etcher. “Such,” says one writer, “were his powers of nature, such the grandeur, pathos, or simplicity of his compositions . . . that the most cultivated eye, the purest sensibility, and the most refined taste, dwell on them enthralled . . . He possessed all the empire of light and shade, and all the tints that float between them; he tinged his

pencil with equal success in the cool of dawn, in the noonday ray, in the livid flash, in the evanescent twilight, and rendered even darkness visible." Speaking of the Scriptural subjects, Sir Charles Holmes says :—" Had Rembrandt never lived, stray flashes of the genius of a Titian, of a Dürer, of a Holbein, might still have illuminated for us some of the deeper shadows of the human soul ; but the association of God with toil-stained inglorious man would have lost the single interpreter whom our age of reason does not in its heart disavow." Comte defined art as consisting in the three processes of observation, imitation and idealisation ; Legros once defined it as " The eye to see, the heart to feel, the hand to follow." Rembrandt possessed these qualifications *par excellence*, and was indeed a master. Speaking of the etchings, Hamerton says :—" I have been studying the works of Rembrandt's immediate predecessors and contemporaries in etching, with a view to understanding his relative position. The result has been only to deepen my sense of the master's incomparable greatness, of his sterling originality, and especially of that wonderful quality by which he does not belong merely to the seventeenth century but quite as much to our own. In like manner, when it comes, he will be at home in the next, and in many another after it."

Not that his work has gone uncriticised or that its merits and demerits have not been keenly discussed. Yet the general verdict is unmistakable. " As an etcher," writes Mr. Hind, voicing the general sentiment, " he never had a serious rival until the last fifty years, if we except Van Dyck's superb but scanty work in the single field of portraiture. To-day it may reasonably be granted that Goya, Méryon, Haden, Whistler and Legros have each added their quota to the great traditions of the art, introducing more than one element of which Rembrandt had no conception. But in the range of his sympathies, in so many spheres of expression, in his perfect craftsmanship . . . and in the depth of human insight with which his whole work is illumined, Rembrandt still stands without an equal as the supreme master of the art of etching."

His labour and devotion were not in vain. Students of etching, the world over, have admired and copied his etchings. Legros used to say, at times, to a Rembrandt collector of his acquaintance: " Montrez-moi des Rembrandts, pour me remettre les yeux." The influence of his technique, especially that of his landscapes, pervades almost all subsequent etching, and it would be difficult to name any great etcher since, who has not, at some time or other, come under his spell. They have learned that such works as these are not produced without assiduous attention and constant practice, for excellence, as Sir Joshua Reynolds said, is never granted to man but as the result of labour, and even then, we may believe, there must be a touch of genius thrown in. As Monsieur Coppier says :—" Masterpieces like these can only be produced by taking a long breath and by slow conception, whatever modern youth may say. They are an effort of science and conscience, sustained by inspiration, and carried through by happy sacrifices." And if any artist would die happy, he must learn that the viaticum of the true artist is the consciousness that he has dealt faithfully, as Rembrandt did, with the highest ideal

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No. 4060

FRIDAY, SEPTEMBER 12th, 1930

VOL. LXXVIII

All Communications for the Society should be addressed to the Secretary, John Street, Adelphi, W.C.2.

NEWS OF THE WEEK

"And at this house, which is high, every one that passeth by it shall be astonished and shall hiss; and they shall say why hath the Lord done this unto this land and to this house."

1 Kings, 9, 8.

"Agriculture is the tamer of men—the steam from the earth is like drinking their mother's milk."

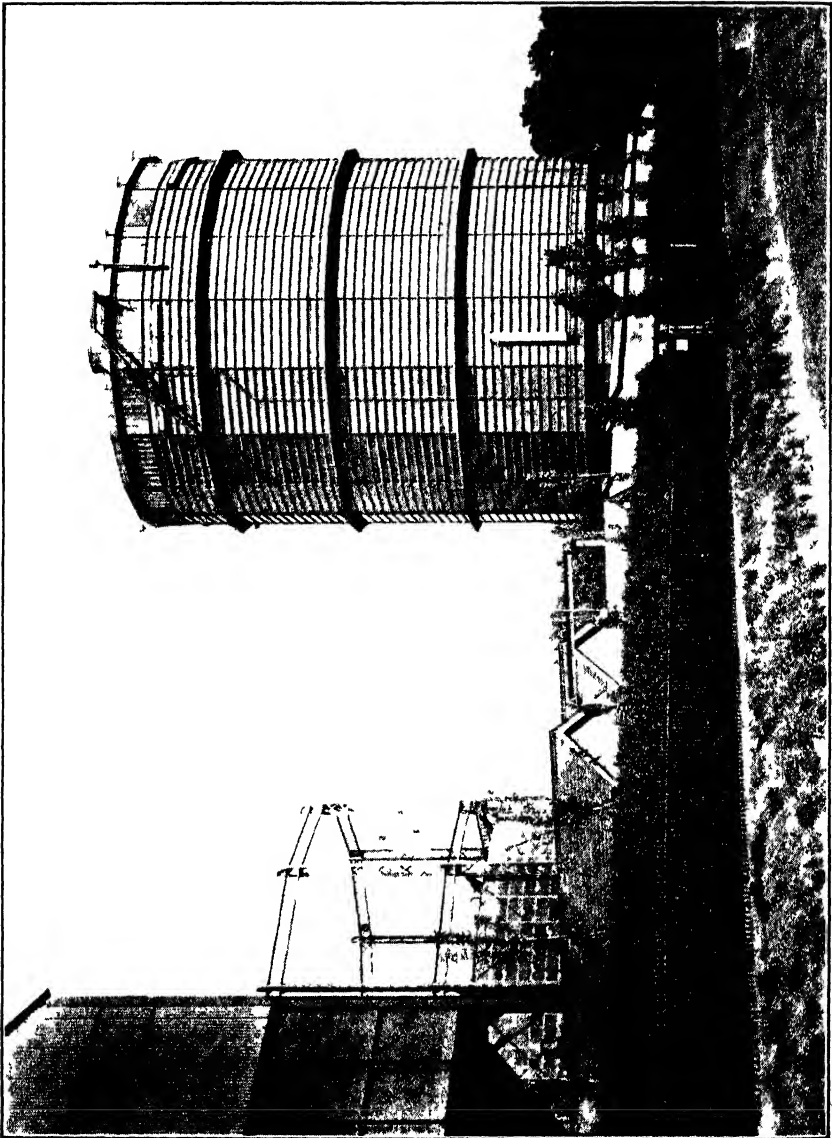
John Keats.

The Harrow Gasometer.—We give two illustrations of the most recent gasometers. It is interesting to compare these with the attractive drawing of a gasometer shown in the *Journal's* issue of August 29th. The artist with a sure eye has corrected in the drawing the defects of the gasometers, as shown in the photographs.

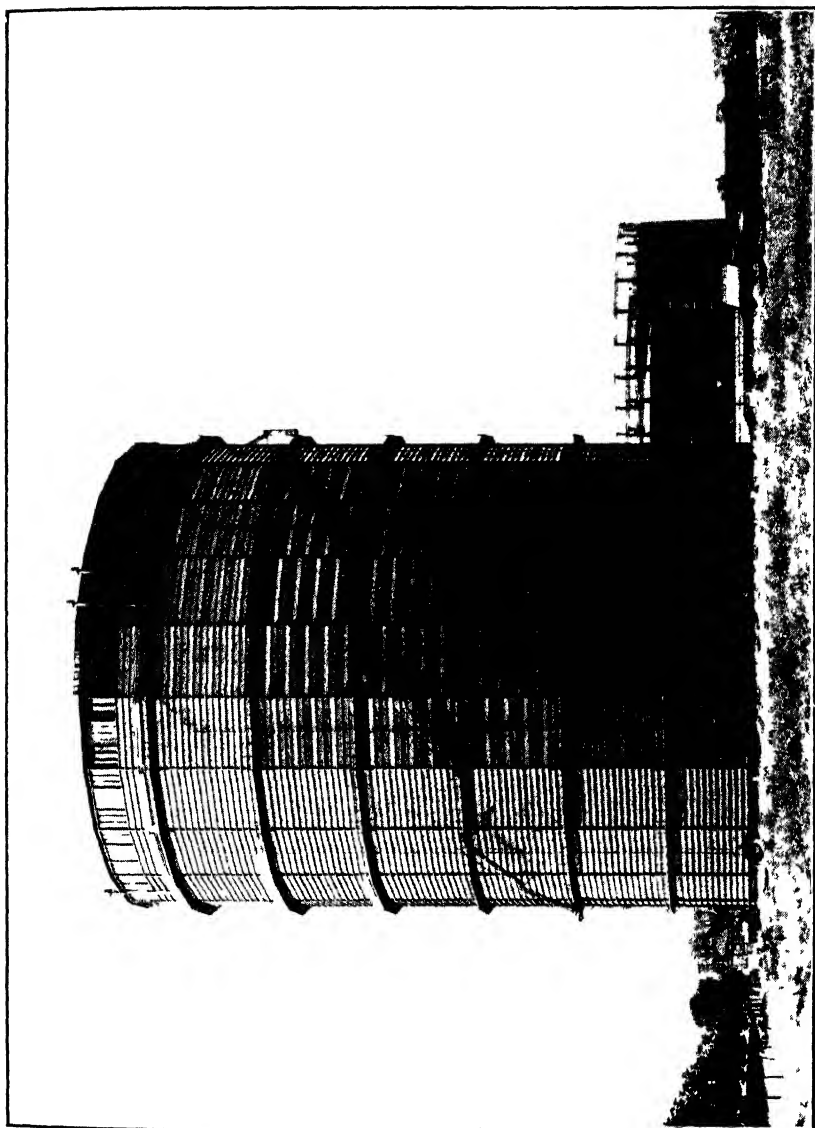
In actuality—

- (1) In the drawing the huge pile appears to taper. In the photograph it appears wider at the top than at the base.
- (2) There is no base, but the artist slurs the defect and gives scale and imagination to his drawing by planting a tiny cottage.
- (3) The structural lines of the cresting seen against the sky are so thin that they do not count. The artist strengthens these structural lines and gives them a satisfying form.

This suggests that it should be possible, if the controlling necessities were set out by the gas expert, that within those lines some mind with a sense of form should be able to make even a gas holder possible in the landscape. The base would be controlled by the position of the holder on the particular spot and might even be made up to the first gallery. The surrounding sheds and buildings should be planned to reduce the scale and give as many horizontal lines as possible and much might be done with judicious planting. Mr. Sickert suggests stone



The Latest Type of Gas Holder—J gham



The Latest Type of Gas Holder—Southall

colour as the ideal colour for the paintwork, and we agree, if the holder happens to be set against a dark background of distant trees. It seems to us all a matter of individual composition and careful study of the particular holder on the particular site. Green has been tried at Poole and elsewhere, but the suggestion of green is to camouflage as much as possible the existence of the holder. Stone colour would be ideal if the form could be made, as we believe it could, tolerable, or even effective by careful placing. The base could, in any case, be darkened.

Dorchester on Thame.—*The Builder* of this week calls attention to this very lovely village and says :—

“ Fortunately, this cluster of old and lovely houses has as yet been less disturbed than is elsewhere often the case, though the changes already made are sufficiently grievous to put its protectors on their guard against further violations.”

We are familiar with this village, which is not so very far from West Wycombe, and we hope the owners of the village will realise what an asset they have in these unspoiled cottages and will see that the very considerable repairs necessary for its preservation are made. Structurally, these buildings will carry on for generations. It is only wasteful neglect that impairs their life.

The Savile Club.—Walking along Piccadilly it came as a shock to see the space between the beautiful building of the St. James' Club and the Hotel Splendid widened by the absence of the familiar little bow-fronted house which was for so many years the home of the Savile Club associated with many distinguished men of letters and perhaps in particular with Robert Louis Stevenson. The building was known to be doomed for some time, but we heard that it was being used as an annexe to the Hotel, and so half hoped that it might have been saved for its associative interest. The interior was full of charm, and the details of the entrance hall seemed characteristic of the work of John Soane.

Village Inns.—Last week's *Punch* has a delightfully humorous page illustrating the process of modernising an artlessly simple old inn, of which there are innumerable examples all over the country. The three pictures show the transition of “ Business as usual during improvements ” with a familiar exactitude which almost discounts the humour. The structural outline of a typical inn is retained, but in the remodelling undertaken every conceivable effort is made to destroy the simplicity of the original. Needless to say, the plain plaster surfaces are torn off in order to expose the structural timbers, the showing of which seems to be essential for the recognition of a building's antiquity. We hope all provincial papers will get permission from *Punch* to reproduce these illuminating sketches.

Skyscrapers.—We have received a very interesting letter from an Englishman living in New York, from which we quote as follows :—

“ I was very interested in reading the recent correspondence in London papers regarding the proposal to substitute skyscrapers for some of the London buildings. I have now lived for eleven years in New York, and I know the misery of living in a skyscraper—moreover, when one is built everyone else wants to build one, and so you arrive at the state when you can't see the skyscraper for skyscrapers. Moreover, London is not a restricted piece of ground like New York. There, it is a necessity. Here, it is not. I get so annoyed with the blind admiration (of the half-educated) for all that is vulgar in U.S.A., and which is called progress—a word I hate, because “ progress ” in the minds of the average County Councillor or average Member of Parliament, means everything that is nasty. Synthetic food, a hundred families piled into one great building, all being heated (or roasted) by the same heating plant, and walls so thin that you can hear your neighbours breathe next door; concrete roads running straight across country; model bungalows, petrol pumps, white chalk signs on the roads. Let us hope that there are enough educated people left to stem this devastating tide of “ progress.” The half-educated go to America and bring back with them all its worst features, all those things that educated Americans themselves hate, and are for ever trying to run away from. No American who can help it ever spends more than three months in the year in New York, or in the City in the U.S.A.—he is always off to Hot Springs, and then Florida, and Bermuda, and always spends a large slice of his time in Europe. He hates the “ progress ” of his own country just as cordially as the people with vision hate such things in this country. I hope people get up and shout it, and write and talk it, and say No to this progress. If we could ensure that everyone could eat good food and not the synthetic (all with the same taste, or rather no taste at all) food of the progressive countries, where people in thousands live on nothing but canned goods, and frozen meats and fish, and never know the taste of a fresh vegetable or meat, and where people could still enjoy the ennobling life of living in their own houses with their own gardens, which makes for individuality—all these tenement-dwelling, synthetic food-eating people are all made in the same mould ; they think the same, if they ever think at all ; eat the same ; dress the same; and stream out in endless processions, one behind the other, in the same cars, the nose of one touching the back of the other, seeing nothing and hearing nothing—we should then be making real progress. So go on fighting. *As sure as you allow one skyscraper in London*, in five years time you will have a hundred, because there is money in it, provided there are not too many. For a time, it is very paying, as the rents in proportion to what you get for it are enormous. There are people who would like London to have the same sky advertisements at night as Broadway has, naturally the same type of mind, the half educated. The cheap slogan used by the same people that we should copy America in business, the “ go and get,” the “ get away with,” “ hustle ” phrases they love, because they only half understand them.

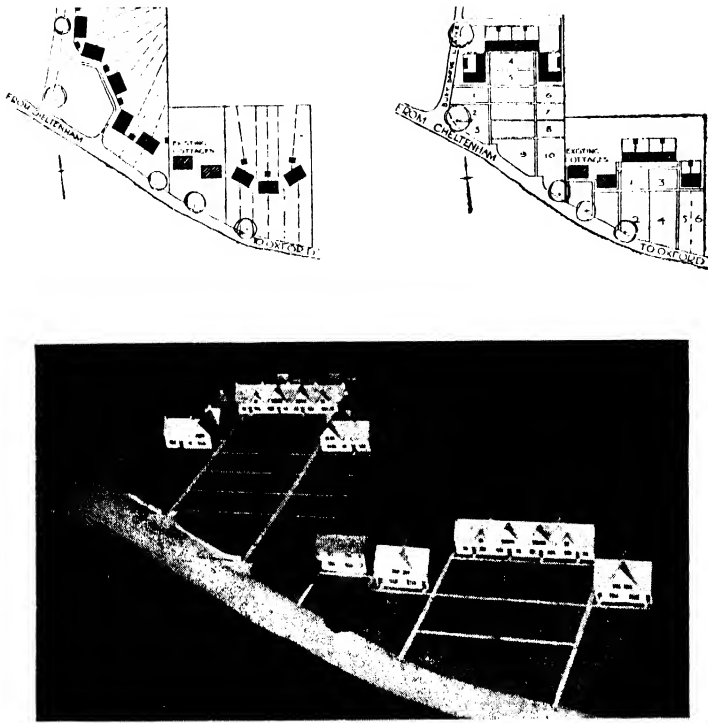
“ I hope the Royal Society of Arts will go on fighting for a more educated view of living.”

The Preservation of the Cotswolds.—On May 16th we gave an account of the experiment made by the Hon. Stafford Cripps, K.C., at Filkins of building, with his own workpeople, and with the consent of the Witney Urban

District Council, of four cottages in the local Cotswold manner. It will be recalled that Mr. Arthur Greenwood, the Minister of Health, was so interested in Mr. Cripps' experiment, that he offered to give it official approval by his personal attendance at a public meeting on the completion of the cottages. It is to be regretted that the fullest advantage of this experiment in building by a private landowner does not appear to have been taken.

The Witney Rural District Council had not started the sixteen cottages at Burford until the Filkins cottages were practically completed, and a representative of the Royal Society of Arts was asked by the Ministry of Health to attend a meeting of the Council, and endeavour to persuade them to hold their hand in view of this experiment and definite facts which made it clear that these Burford cottages could be built in the same manner with their units grouped to suit the different conditions of the site. It was also pointed out to them that if these cottages could be carried out to the same specification some of the items in the Filkins accounts would be affected beneficially by reason of the larger standardisation of such items as doors, windows, door furniture, fireplaces, etc. We illustrate the Burford site with two block plans showing (a) the arrangement of houses as now being built, with a very irresponsible and spotty lay-out; (b) the arrangement as suggested by the site and the existing cottages, setting the houses well back from the dangerous traffic on the road, and giving as much of the land as possible for gardens with south aspect; (c) photograph of model made to demonstrate the advantages of this grouping. We leave our readers to consider what the beautiful and historic town of Burford has lost in its main approach, and by its Council not availing themselves of this considered effort to prove beyond a shadow of a doubt that building in the Cotswolds can return to its vernacular manner if educated laymen, like Mr. Cripps, will take the trouble to instruct their Councils in the use of local materials, and in the placing of the units in conformity with the shape and aspects of the sites selected for housing. Mr. Arthur Greenwood aptly put the whole case at the opening of the Filkins cottages:—

“ But your problem is not merely a problem of seeing that people have decent shelters over their heads, important though that may be. It is to do it in such a way that your children will not be ashamed of you. Many of us to-day are ashamed of what the generation before us has done, and what, indeed, people of this generation are doing to defile the countryside. There was a persistent beauty about our countryside. Buildings had been incorporated in the landscape and were as much a part of the countryside as the hills and valleys with their streams and trees. There was no reason why that should not continue. There was no reason why they should invade the countryside with structures that were foreign to the countryside. We hate to see the sprawling, disorganised development of buildings which were ugly in themselves, and formed no part of the countryside on which they had been planted. Where they had a well-established architectural tradition that had woven itself into the fabric or life of a district, there was not much to be gained by imitating some of the dreary streets of London or Birmingham. We are attracted by the traditions of the Cotswolds. They



were worth maintaining and preserving. They were in a very intimate way a part of the very lives of the people in the area. I hope the representatives of public authorities present would find a real interest in the new cottages which had been erected in the village. There was no reason why there should not be more houses of that type. We should never be a self-respecting nation so long as we permitted families to dwell under conditions which were not merely depressing, but were unhealthy, demoralising, and soul-destroying. I consider that these cottages will, in the fullness of time, become the soul of the Cotswolds."

NOTICES

ARLINGTON ROW, BIBURY

By kind permission of the Rev. and Mrs. W. H. Spurrier, a garden meeting will be held at Bibury Vicarage, Glos., on September 18th, when Arlington Row, the beautiful group of cottages purchased and re-conditioned by the Royal Society of Arts, will be handed over to the Gloucestershire Archaeological Trust.

Fellows of the Society desiring to attend are requested to apply for cards of invitation to Mr. H. Stratton Davis, F.R.I.B.A., Secretary, Bristol and Gloucestershire Archaeological Society, 12 Queen Street, Gloucester.

COMPETITION OF INDUSTRIAL DESIGNS

SPECIAL COMPETITION FOR DESIGNS IN BEATL

A special section of the Society's Competition of Industrial Designs will be held in November next. Three first prizes of £100 each, three second prizes of £50 each, and three third prizes of £25 each, will be offered for designs for articles to be manufactured in Beatl Ware. The competition is divided into three sub-sections: (a) Designs for Door Furniture, Electric Lighting Parts, and Bell Pushes; (b) Designs for Lavatory and Bathroom Equipment; and (c) Designs for New Uses for Beatl.

The competition is open to all, and in view of the substantial prizes and the novelty of the subjects, it is hoped that the number of candidates will be large.

Particulars of the competition can now be obtained on application to the Secretary, Royal Society of Arts, John Street, Adelphi, W.C.2.

PROCEEDINGS OF THE SOCIETY

CANTOR LECTURES

THREE MASTER ETCHERS: REMBRANDT, MERYON, WHISTLER

BY HAROLD J. L. WRIGHT

LECTURE II.—*Delivered January 27th, 1930*

THE ETCHINGS OF CHARLES MERYON (1821-1868)

We turn from the etchings of Rembrandt, which we were considering in our previous lecture, to those of another master-etcher, Charles Meryon. Rembrandt died in 1669 and Meryon was not born until 1821, yet between those dates few etchings of any consequence, save those of the Tiepolos, Piranesi, Canaletto and Goya, were issued to the world. The Eighteenth Century, rich in so many forms of art, was singularly unfruitful in fine etchings, especially in France where we have to leap from Claude to Meryon—passing lightly over Fragonard. Line-engraving and mezzotint had put etching out of court. Meryon was indeed one of the pioneers of that great revival of etching witnessed by the Nineteenth Century and handed on to the Twentieth. By the intensity of his vision, and scarcely less by the completeness of his performance, he goes down to later ages in association with Rembrandt and Dürer. Doubtless there are limitations to the things he saw and felt. His great plates are few in number—his whole work comprised only a hundred and two etchings—but how unique are his best, how arresting, how certain, how unforgettable! As Wedmore says: "Of the vast field of art Meryon tilled but a corner. But with what result!"

Here is an etcher whose fame may be said to rest entirely upon about a dozen plates, those known as his "Paris" etchings. The remainder, with few exceptions, were made during mental instability, or that he might earn an independent crust at the hands of friends who commissioned them, and their interest lies chiefly in the pathetic circumstances in which they were produced.

Charles Meryon and the greater part of his work are so entirely one, that some knowledge of his life and character and circumstances are indispensable to a true appreciation of that work. He was the natural son of Charles Lewis Meryon, an English surgeon, and of Mlle. Pierre-Narcisse Chaspoux, known as Madame Gentil, and was born in Paris on November 23rd, 1821. His father, well-known as the physician and private secretary to the remarkable and eccentric Lady Hester Stanhope during her travels and residence in Syria, was a member of an old Huguenot family that had settled at Rye after the Edict of Nantes. The name is indeed said to have been originally Mérygnan. Dr. Meryon's frequent residence abroad made it impossible for him personally to superintend the education and upbringing of his son, but he provided for him liberally, and his mother (in whom the artist always believed there was a trace of Spanish blood, and who was, by all accounts, somewhat wayward, having a string of admirers always within call) watched over his early education with unceasing care.

He was put to school at Passy, where, as he has recorded, he went at first by his mother's name, Gentil. He proved an excitable and fitful scholar, but it was here he received his first lessons in drawing. In 1837, at the age of sixteen, he was admitted to the Naval School at Brest, leaving two years later with a second-class certificate. He was sent first to the "Alger," and later to the "Montebello," being by then promoted to the first class. In this ship he visited Algiers, Tunis, Smyrna, Athens, and other Mediterranean ports. During the voyage, as on succeeding voyages, he was busy with his pencil, and developed those sketching habits which were later to be the basis of his great work; in fact, when the "Montebello" returned to Toulon, Meryon took lessons there from a painter named Victor Cordouan.

Meryon's mother died in 1838—insane, according to some, though Meryon always denied this—and in 1842 he again went to sea, this time as midshipman in the "Rhin" which was ordered to New Zealand to protect the French settlers there. Wherever the ship touched—and it visited New Zealand, New Caledonia and Oceania—Meryon made numerous sketches, especially of the Maoris and their dwellings and carvings. Many of these sketches are still in existence; the British Museum possesses quite a number. Returning home in 1847 he applied for and obtained three months leave of absence, on grounds of ill-health, but in reality because he was more attracted to the Arts than to the command of men, and also, it is said, because his sensitive nature had been horrified by the terrible death of a comrade who had been brutally attacked and roasted alive in the South Seas. Soon after 1847 he resigned his post in the Navy and took up his residence in Paris, renting first a studio in the Rue Hautefeuille, determined to follow Art.

His idea was to become a painter, and he accordingly proceeded to take lessons from a painter named Phelippes, a pupil of Louis David, who set him to work to make careful drawings from the antique—a Venus, the Apollo Belvedere and others—and thus taught him to see the beauty of these great works and doubtless improved his drawing. Meryon also made drawings for a large composition entitled *The Assassination of Marion Dufréne, Island Bay, New Zealand, 1772*, which he proposed to paint. The finished drawing was exhibited at the Salon of 1848, but the painting itself was never completed, as Meryon discovered he was colour-blind and was forced to abandon painting, therefore. At this time he was thinking in allegories; there is in Mr. Atherton Curtis' collection in Paris a scheme of Meryon's for a painting which was to have been entitled *The Era of Light*, and was to have represented the figure of France holding the mirror of Truth and rising from a heap of ruins, an allegory of recent national events.

Meantime, a neighbour, Monsieur Schultz, to whom he had been introduced, had shown him some etchings by Eugène Bléry, views of Fontainebleau. These fired him with an ambition to learn the processes of etching from Bléry himself, and he did not rest until he had been put into touch with him. His first recorded plate, undated, but probably etched in 1849, is the *Christ crowned with thorns* (L.D. and W.1),* a copy of a miniature by Mlle. Elise Bruyère, after a painting by Philippe de Champagne. The only impression known of this little plate, formerly the property of Bléry, and given to him by Meryon, is now in the Art Institute of Chicago, where one of the best collections of Meryon's etchings is to be found. Philippe Burty, the eminent French critic, who did so much to encourage the revival of etching in France, spoke of this little plate very flatteringly—too flatteringly, Meryon insisted. Whilst with Bléry, Meryon also made a small portrait etching of his friend *Edmond De Courtives*, the only known impression of which, formerly in Mr. Macgeorge's collection in Glasgow, is also in the Art Institute of Chicago (L.D. and W.76). Following this there were about fifteen close copies of etchings by Karel du Jardin, Salvator Rosa, Adriaen van de Velde, and others, of which two of the best are the *Standing Soldier, in profile*, (after Salvator Rosa, (1849) (L.D. and W.3), and the *Three swine lying in front of a sty*, after Karel du Jardin (1850) (L.D. and W. 6). But his greatest discovery at this time, of prints to copy, was the etched views of Paris by Renier Zeeman, which he tells us he came across one day when turning over the portfolios at Monsieur Vignères' shop. In these etchings, originally published in Amsterdam in 1650 by Clement de Jonghe whose portrait by Rembrandt we have seen, it was the dexterous clearness of the lines, the quietness of the tone, and the brilliance of the biting that struck Meryon, and acquiring them, he promptly made close copies of them. It was whilst copying them that he conceived the project of a series of his own of Views of Paris.

“ Full many a flower is born to blush unseen,
And waste its sweetness on the desert air.”

* The reference L. D. & W is to the illustrated catalogue of Meryon's etchings, by Loys Delteil and H. Wright, New York, 1924.

But not all. Here and there a passing traveller happens upon one that he tenderly gathers, and quietly enjoys, finding in its fragrance inspiration, and in its courage a challenge. So it is with prints. Oft-times long hidden in dusty, mouldy portfolios, they have a habit of springing one day to the view of some spirit in sympathy with the author of them, suggesting to him unsuspected possibilities in material lying at hand. An interesting book might be compiled by collecting the confessions of etchers and engravers on the subject of prints they have chanced upon that have influenced them. It would contain some surprising revelations, too. Monsieur Laboureur, for instance, would tell us he has been a great admirer of the engravings of Mantegna and other Early Italian Engravers.

But to resume. Meryon copied four of these views of Paris by Zeeman—the *Pavillon de Mademoiselle and part of the Louvre* (L.D. and W.9), the *Entrance to the Faubourg Saint-Marceau* (L.D. and W.10), the *Water Mill near Saint-Denis* (L.D. and W.11), and *The Seine and the corner of the Mall* (L.D. and W.12), the first in 1849 and the others in 1850, in which year also he etched reversed copies of four small seascapes by Zeeman (L.D. and W.13-16). And then at the age of twenty-nine, he jumped into fame at one leap, in 1850, with his superb etching of *Le Petit Pont* (L.D. and W.24), exhibited at the Salon of that year. The view is taken from the tow-path below the Quai de la Tournelle. Meryon has taken liberties with the view, especially of the towers of Notre Dame, so that the plate is in reality a composition; but its magistral effect causes us to overlook all topographical inaccuracies, and we soon settle down to admire it. "For easy conquest of difficulties, for sheer beauty of composition, there is nothing in the Paris set that can claim superiority over the *Petit Pont*," wrote the late Sir Claude Phillips. Notice the sphinx-like silhouette on the wall at the left end of the bridge. This was quite unintentional, and Meryon himself had not noticed it until it was pointed out to him.

After etching the *Le Petit Pont* Meryon appears to have ceased etching for a year, save for one plate of a Bourges subject, the *Porte d'un ancien couvent* (L.D. and W.54), to which we shall return later when we deal with the other plates he made of scenes in Bourges. In 1852 he resumes his plates of Paris, completing five in that year, the *Title-Page to the Paris Set* (L.D. and W.17), the *Tour de l'Horloge* (L.D. and W.28), the *Tourelle, rue de la Tixéranderie* (L.D. and W.29), the *St. Etienne-du-Mont* (L.D. and W.30), and the *Pompe Notre Dame* (L.D. and W.31).

The *Title Page to the Paris set* shows us an imitation of a slab of limestone from the quarries of Montmartre, containing fossils and moss imprints, on which design Meryon has placed the lettering of the title; Burty says Meryon intended it to be typical of the foundations of Paris. Note *en passant* the exact wording of the inscription: "*Eaux-fortes sur Paris*"—(etchings *on* Paris). It is a cue to the mentality in these etchings, for there was poetry in Meryon. It was not merely as an etcher or draughtsman that he depicted these glimpses of the fine old city, for, as Balzac had found, the streets of Paris have human qualities, and as

Mr. Campbell Dodgson has said : " The old streets of Paris were not for Meryon merely storehouses of picturesque motives, structures composed of walls and porticos, gables and spires, on which the sun arranged, at different times of the day, different patterns of light and shade ; they were that, certainly, and his etcher's eye . . . took full advantage of their hitherto unexplored wealth of suggestion . . . His actual eyesight was astonishing. He saw details of architecture with the naked eye which would be revealed to average persons only by a telescope. For him the streets of Paris were haunted, peopled with ghosts and wet with tears. Their atmosphere was infected by old crimes and miseries and sins. The lonely meditations of a brain already morbid—even when he was a boy he was affected by the discovery that his father had only acknowledged his birth three years afterwards and in later life he was always suspicious and shrank from human intercourse—were reflected in the melancholy which seems, to sympathetic observers, to brood over these narrow streets." This feeling for the interest and mystery of city life was possessed by Meryon in high degree ; it gave to his work a quality altogether exceptional in pictorial art, though found, on occasion, in the heart of literature—in Victor Hugo's " Notre Dame " for instance, in Scott's " Heart of Midlothian," and in Dickens.

The *Tour de l'Horloge* (L.D. and W.28), was drawn and etched whilst alterations were in progress which have materially altered the appearance of Le Châtelet, but the view has lost nothing in picturesqueness on that account. The twin-turrets are those of the Palais de Justice, and the bridge in the foreground is the Pont-au-Change which has since been demolished. It was the bell in this tower that gave the second signal for the Massacre of St. Bartholomew. The plate forms, therefore, a page in the history of Paris as well as a page in the history of art, although it is perhaps a more straight-forward portrait of a building than some of Meryon's plates. There is a magic in its chiaroscuro, a dignity about it, that were hitherto unknown in architectural etching ; indeed it is difficult for us who have seen so many architectural etchers working since on Meryon's lines, to realise how new, how epoch-making were such etchings as *Le Petit Pont* and *La Tour de l'Horloge* in 1852, though one has only to consider what were the popular styles of engraving in France in the early days of the Second Empire to understand why Paris did not readily appreciate the merits of its most sincere and original interpreter. Etchers were, at that time, nowhere in popular favour, and though there had been excellent etchers of architecture earlier—Hollar, Canale, Piranesi, and Rossini for instance—never had architectural subjects been etched with such concentration, technical mastery, insight and imagination.

In the three final states of this plate of *La Tour de l'Horloge* Meryon introduced two beams of light protruding from the windows immediately to the right of the Clock tower, but by this change he merely produced a sensational effect, spoiling the quiet dignity of the scene. This is a print to possess in an early state, therefore. In the *St. Etienne-du-Mont* (L.D. and W.29), we see the west front of this famous church—that queer architectural mixture—with the old

Gothic Collège de Montaigu on the left, and, on the right, where the workmen are seen, the corner of the Panthéon. There is in this etching a beautiful effect of sunlight, and exquisite detail, whilst the chiaroscuro effects again give it a splendid pictorial appeal. Meryon was living in this quarter of Paris when he etched this plate.

Somewhat similar in effect, and companion in size, is the *Tourelle, rue de la Tixéranderie* (L.D. and W.30). The turret stood at the corner of the Rue du Coq, and was demolished in 1851. The mediæval knight in helm and plumes who rides along the street is a picturesque but curious addition to the scene. There is no doubt that Meryon felt called to record, with his pencil and his etching needle, these bits of Old Paris doomed to early destruction, for there was in him a great love of the past which was doubtless shocked by the fever of demolition that had set in among his fellow-citizens.

In the remaining plate of 1852, the *Pompe Notre Dame* (L.D. and W.31), we have a fairly faithful view of the old pump which was demolished six years later. The towers of Notre Dame rise higher above the houses than they did in reality, but Meryon allowed himself this licence, since, as he said "it is in this way that the mind works as soon as the actual objects which have arrested its attention have disappeared from sight." In the late Mr. B. B. Macgeorge's famous collection of Meryon's etchings, the basis of which was the collection formerly belonging to the Rev. J. J. Heywood, there were three studies for this etching. The Macgeorge collection was purchased by Messrs. Colnaghi in 1916, and as attempts to sell it *en bloc* here or elsewhere failed, it was broken up and dispersed, the bulk of the proofs being now in America, the majority of these finding a permanent lodgement in the Art Institute of Chicago.

Meryon's practice in sketching was to go, at the same hour, every day, to the site he had chosen, and to draw, on small pieces of paper, studies of the various portions of the scene, rigorously exact in their details. He used a very hard, fine-pointed pencil which he held as one does a burin, working with it in light, incisive strokes upward. Asked once why he worked thus, upward, he replied, "Because the buildings themselves are constructed from the base upward." His practice in etching was similar; it is said he used to stand his plate upright on an easel, and, holding the etching-needle like a sword in his extended hand, draw the lines upward. The lines in Meryon's etchings are thus, be it noted, not of the traditional, free, spontaneous variety generally produced by the painter-etcher. They are more like the lines of an engraver. He was always sure of his touch, and knew exactly where to set his lines and how to contrast them. A friend said that he was the most downright honest fellow in the world. We see that in his work, for in it there is not the slightest affectation.

Meryon's pleasure in constructive work is nowhere better shown than in this plate of the *Pompe Notre Dame*. Did this pile of scaffolding remind him perhaps of some lake-dwelling he had seen during his voyages? In any case the labour of



Le Stryge.

men's hands always possessed an irresistible attraction for him. The *Pompe Notre Dame* remains unrivalled in its kind, save perhaps by Muirhead Bone's "Building" which is a direct descendant from it, but a drypoint.

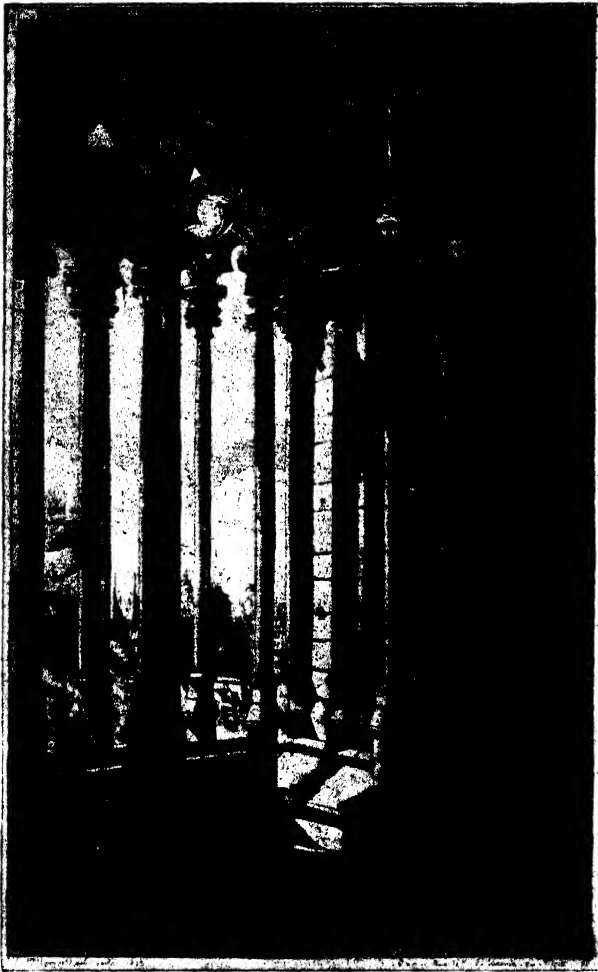
Dating from the following year, 1853, we have six plates; four of them are part of the Paris series, the fifth is a Bourges subject, and the sixth is a plan of a naval action. The first of the four Paris etchings of that year is *Le Stryge* (L.D. and W.23), which has come to be regarded as one of Meryon's finest plates. The artist first entitled this plate "La Vigie" (the look-out), but later changed it to *Le Stryge*. The allusion is, of course, to the stone devil, leaning, with tongue protruding, over the balcony of the tower of Notre Dame, one of the most magnificent examples of those grotesque mediæval sculptures so familiar to visitors to Notre Dame, Paris. To Meryon he is a vampire, eternally brooding over Paris, feeding upon the lust and avarice of the old city; and the artist has etched an inscription to that effect on the fourth state of his etching, which is on that account the state most coveted by all collectors, especially when it is printed on the greenish paper Meryon so often employed when printing the earliest impressions

from these Paris plates (with one exception only, that of the *Abside de Notre Dame*). As a matter of fact, it was to sketch the "Tour St. Jacques" which we see in mid-distance in this etching that Meryon had ascended to the balcony of the tower that day; but this grim sinister figure loomed in the line of vision, and Meryon's poetic mind at once invented an eerie significance for it, and focussed upon it, as does our own gaze when we look at it in Meryon's etching. Wedmore records that, speaking in later years of this etching, Meryon said to a friend, "You can't tell why my comrades, who know their work better than I do, fail with the 'Tour St. Jacques'? It is because the modern square is the principal thing for them If they saw, as I do, an enemy behind each battlement, and arms through each loophole, if they expected, as I do, to have boiling oil and molten lead poured down on them, they would do far finer things than I can do They are never haunted by this monster The monster is mine and that of the men who built this Tower of St. Jacques. He means stupidity, cruelty, lust, hypocrisy—they have all met in that one beast." We see it is true. He has been the silent witness of the many crimes that have stained the streets below with blood—the terrible judicial murders of the Place de la Grève, the savage outbursts of the Revolution, the incendiary flames of the Commune—and in our own time has been shaken by the enemy's shells and has watched the long procession of mourners assembling at Notre Dame to pay homage to their dead in the Great War.

Monsieur Aglaüs Bouvenne, in his "Notes et souvenirs sur Charles Meryon," reproduces a pencil drawing of another of these grotesque figures on Notre Dame, that of a monkey. Like the *Stryge* it is accompanied by a set of verses; but it has nothing like the power and attractiveness and glamour of the *Stryge*, which remains therefore arrestingly unique.

The *Arche du Pont Notre-Dame* (L.D. and W.25), is a small plate giving us a glimpse of the distant Pont-au-Change from beneath the Pont Notre Dame. Seen in the beautiful proofs on green paper which are sometimes to be met it is one of the most charming of the Paris plates, free from any eccentricity. More perhaps than any we feel it may have been the precursor of several of Bone's finest plates. In the *Galérie Notre Dame* (L.D. and W.26), we have one of the great plates again, a lovely rendering of the Gothic architecture of this grand old cathedral church so beloved by Meryon. In this etching there are most delicate effects of light, both direct and reflected. Not many entirely satisfactory impressions of it exist, for some reason or another, and when they are met with they are usually found to be printed on the green or greenish paper we have mentioned. This etching was honoured by rejection at the Salon of 1853, but it is now one of the most coveted. It was Victor Hugo's favourite; the view from this window is described by him in his "Notre Dame," in the chapter entitled "A Bird's-Eye View of Paris."

The fourth Paris plate of 1853 was *Le Pont Neuf* (L.D. and W.33), a view of a couple of arches of the oldest bridge in Paris, showing the truncated



La Galerie Notre Dame, Paris.

turrets on the bays of the parapet, in which, at the time the etching was made, there were shops. There is not much to be said about this etching save to praise its splendid rendering of architecture. When Meryon etched it the bridge had been recently restored, and in the sixth state of the plate he added eight lines of verse : " Here is a faithful view of the ancient Pont Neuf, all painted up in accordance with recent decree. O wise doctors and clever surgeons ! Why do you not restore us as they are restoring the old stone bridge ? "

In 1854 Meryon etched altogether seventeen plates, the most he etched in any year. Thirteen of these appear in the Paris set with which we are dealing ; five

of these thirteen are actual views and the remainder have some bearing on the series. We will take the views first. There is the small etching of the *Old Gate of the Palais de Justice* (L.D. and W.19), which was etched on the same plate with another etching in the series, the *Tomb of Molière*. In the sky above the twin turrets of the Law Courts is a flying demon supporting a banner on which is inscribed "Eaux-fortes sur Paris par Meryon." Meryon etched some verses to accompany this plate, which read: "Let the pure soul blush and groan if it must, but I have chosen here for frontispiece this little wicked mutinous imp, dominating with his wings these old twin towers of Paris—Paris, paradise of love and laughter, the city where Science, of diabolic origin, brings forth many a scion destined to be clawed by Demons. This wicked little sprite, origin of evil, has chosen to make his habitation in our city. The situation is truly serious, and sadly I proceed to etch, for I fear that to rid the city of this menace we should have to demolish it!"

In the *Rue des Mauvais Garçons* (L.D. and W.27), we have one of Meryon's most celebrated etchings. It is a view of a sinister street demolished in 1851, although there is still in Paris a street of this name off the Rue de Rivoli, near the Musée Carnavalet, in which museum, by the way, the name stone of the old street is preserved. Looking at Meryon's pencil sketch of these houses one could not guess what an arresting plate he made of it, for the drawing is hardly more than a shorthand note. The etching itself is one of the most prized of all, for it contains more of Meryon's eerie vision than perhaps any other save the *Morgue*. In its final state Meryon has etched upon it verses which may be translated thus: "What mortal dwelt in this dark lair? Whoever used to hide himself o' nights in this shady hole? Was it poor silent Virtue? Crime, you say, or some vicious creature, perhaps? Faith, I cannot tell. If you are curious to know, go and see. There is still time!" The true Meryon, the man in whose most bitter pessimism and irony there is never wanting an element of grandeur, is seen in this wonderful little plate. Baudelaire greatly admired it.

Le Pont-au-Change (L.D. and W.34), is a larger plate of spacious design, and went through no less than twelve states in all, in each of which there are significant alterations or additions. From the second to the sixth state the balloon "Speranza" floats in the sky at the left, to which incident a little plate of verses entitled *L'espérance* (L.D. and W.35), etched in this same year, refers. In the eighth state this balloon is replaced by great flights of birds, ducks below, albatrosses above, a cryptic reference to recent political events. In the final state, several balloons replace these flights of birds. The majority of these great changes were made by Meryon after his malady had begun to show itself and must hence be regarded as eccentricities. All the same, there is some element of sanity in the verses "L'espérance" made to accompany this etching, of which a free translation is as follows:—"O divine Hope, light balloon! Like a frail bark, rocked by the rolling wave, stirred by the careless autumn breezes, rise, and amid the mists driven by the winds, show thyself sometimes to our eager eyes and let us see thee against the blue skies of those placid upper regions where the fruitful rays of the

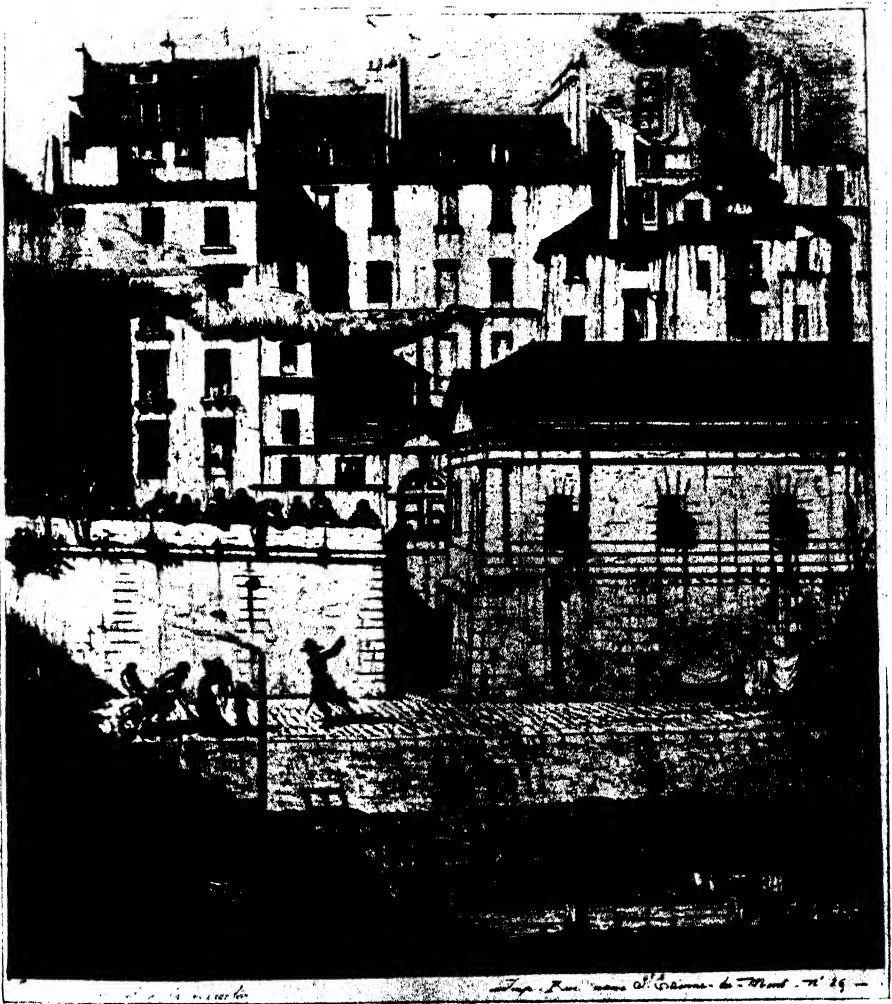
brilliant sun outline with gold the windows of the doubtful future. Come and restore the courage of the sailor exhausted by the storm, of the warrior who, hoping for a better fate, is braving misfortune, of the poor wounded heart vainly seeking on earth that longed-for happiness, beheld afar, but as yet unexperienced.

"But, oh, sad dreamer, why wander thus amid the clouds when pictures are demanded? Come back to earth; cease to climb those rough roads to the skies; fear thus to tempt the caprice of Fate, for she is ever miserly with her favours. Since a new destiny has made an etcher of thee, over-frail sailor, and has put into thy hands the etching-needle, so work that upon the black grounded copper thy hand may trace those ripples that should always follow every skiff that sails the stormy sea of Life—that bitter ocean where, alas, all too frequently, the lying hope that led us on deserts us just as we approach the shore!"

No etching of this now famous series is so intensely tragic, so absolutely an expression of Meryon's obsession with the blackness, the hopelessness of things, as the *Morgue* (L.D. and W.36), which, moreover, from the technical point of view is a singularly original and arresting achievement in its masterly distribution of black and white. Many of us doubtless were curious enough to visit that lugubrious chamber of death when, until a few years since, its doors lay open to the passer-by, and we may have seen, as Meryon did "the bed and table with the cool stream of water playing on it that Paris offers gratis, at any time, to its poor children," and the little procession of citizens, sometimes with their shopping-baskets on their arms, passing before the corpses, curious but fearful lest they should discover the body of some unfortunate friend who had been killed or had sought the solution of life's riddles by suicide. Meryon himself etched, on two separate little plates of which impressions are very rare, verses to accompany this plate of the *Morgue*, in which he sums up in poignant fashion his views on the mysteries of life, and seeks to inspire hope in his fellows by pointing them to the stars.

Many regard this etching of the *Morgue* as the most remarkable of the whole series. Burty says: "It would be impossible to make a more moving picture of a group of houses such as these, which, in reality, have little about them to produce any emotion. This pile of roofs, this medley of angles, this blinding light throwing up in relief the old tomb-like building are combined to form an enigma of which the solution is provided by the group of figures. For a corpse has been removed from the Seine, and the poor unfortunate wreck of misery or debauch is being carried into the mortuary, under the eyes of the spell-bound crowd which watches the drama from the parapet above and sees a weeping girl and a fainting woman overcome by despair." Was ever a human tragedy played against a finer background? The contrast between the efforts of mankind to help its more unfortunate fellows and the stolid indifference of nature as personified in these solid buildings is superbly brought out.

The *Morgue* has but one rival for first place in the affections of Meryon's admirers—the noble plate of *L'Abside de Notre Dame* (L.D. and W.38), for



La Morgue, Paris.

early proofs of which more has been paid on occasion than for any other etchings save those of Rembrandt. This justly celebrated plate has a dignity and charm unexcelled by any etching of an architectural subject, the world over. It is interesting to observe that the beautiful old church inspired both this etching and the famous story of Victor Hugo. Certainly the building fascinated Meryon, for he etched, in this same year 1854, verses to accompany his etching of it which, though exceedingly rare, are to be found in the British Museum, where also may be found, as at the Athenæum Club in Pall Mall, an impression of the *Abside* itself on which Meryon has written these verses with his own hand. The verse reads as follows:—"Thou lover of every bit of



L Abside de Notre Dame, Paris

Gothic, behold here this noble basilica of Paris. Our great and pious kings built it, a testimony to their Master of their profound repentance. Although massive, alas it is said to be too small to hold even the élite of our least sinful fellows."

Assuredly the *Abside*, in spite of the few criticisms that have been passed upon it, remains, as Wedmore said, "a masterpiece of refined and exalted beauty."

Completing the series of Paris etchings are the *Tomb of Molière* (L.D. and W.40), the *Arms Symbolical of the City of Paris* (L.D. and W.21 and 22), the *Verses to Renier Zeeman* (L.D. and W. 18), and the *Little Pump* (L.D. and W.32).

Burty says he failed to discover why Meryon chose to etch Molière's tomb in Père Lachaise Cemetery; Meryon himself is said to have attached very little importance to this little plate, and in the series of Paris etchings it served as the tail-piece merely.

Of the *Arms Symbolical of the City of Paris* Meryon made two plates, only one of which was published since he had some queer notion that he had introduced an obscure political meaning into it which might be misunderstood and even censored—a hint at the terrorism of the Empire. The *Little Pump* shows us again the *Pompe Notre Dame* which was then doomed to demolition as the verses on the plate tell us. Meryon suggests that the old pump should seek to stay its doom by pumping out wine, instead of water which so few like!

The *Verses to Renier Zeeman* fittingly form the dedication plate of the series, and express in simple language Meryon's love, as for his other self, for the Dutch Master whose work had inspired these efforts.

The complete series of the etchings forming the Paris set as published by Meryon himself in three parts between 1852 and 1854 consists therefore of twenty-two plates preceded by a *medallion portrait of Meryon by Bracquemond* (L.D. and W.17a) on which Meryon himself etched the title in verse. (There is another portrait by Bracquemond showing Meryon seated; only ten proofs of this plate are known, but there is a deceptive photogravure reproduction of it of which impressions were signed by Bracquemond). The set was issued in paper wrappers of grey, brown, blue or green on which the title plate was printed; it is doubtful if many of these sets remain intact to-day. Meryon experienced great difficulty in selling his etchings, though he asked no more than thirty francs for this set of the Paris plates for instance, and for a single etching would sometimes accept a franc. There are in existence his receipt for a set of these etchings sold to Baron Pichon in 1866 for twenty-five francs, and another for a franc and a half for a proof of the *Abside*, sold to his friend Monsieur Wasset, who, as Meryon says on the receipt, had done him the honour to take several of his etchings. The printing had been done by him or Delâtre with scrupulous care, and we find the early proofs of these plates printed on a greenish paper occasionally, or on a thin old Dutch paper, on Japanese paper, or on Whatman and similar papers. Collectors to-day are often puzzled to know which to select, so different are the effects these different papers give to the appearance of the plates, some giving an almost moonlight effect, some

that of sunlight. Not infrequently, therefore, the collector likes to have examples of all, as the simplest solution of his quandary.

But if the etchings did not sell readily, they had their admirers from the first—Victor Hugo, Baudelaire (who proposed to write some text to accompany them), the Duc d'Arenberg, Monsieur Niel, Monsieur Wasset, Henri Le Secq, his old ship-mate De Salicis, Dr. Gachet and others, and above all, Phillippe Burty the critic, who wrote about them in glowing terms and subsequently published the first list of them, in the *Gazette des Beaux-Arts*, Paris 1863. This list was afterwards amplified by him whilst making his collection of Meryon's etchings, these fuller notes forming subsequently the catalogue which was translated by Mr. Marcus Huish and published in London in 1879, our main source of reference for the facts of Meryon's life and work until Monsieur Loys Delteil's fuller catalogue was published in Paris in 1907. This, in turn, was eventually translated and amplified by me and published through Mr. W. P. Truesdell in New York, 1924, as the result of my comparisons of Mr. Macgeorge's splendid collection of Meryons with the British Museum's proofs.

Meryon's failure to exist on the proceeds of his etchings undoubtedly opened the door to that illness of the mind to which he was henceforth prone, and to which he eventually succumbed. Certain it is that he destroyed the copper plates of his Paris etchings in his chagrin at their failure to sell. For a few years, however, he still retained his love of the picturesque bits of the old towns he loved. Next to Paris it was Bourges that attracted him most. Already in 1851, and again in 1853, he had etched, as we have seen, plates of Bourges—the rare *Door of an Ancient Convent* in the Rue Mirabeau (L.D. and W.54), in which there is some delicate drawing closely resembling that of his pencil sketches; and the *Rue des Toiles* (L.D. and W.55), which was rejected by the Salon of 1853 and is in part a composition, the upper parts of the houses being true to nature, the lower parts taken from sketches of houses in other parts of the town, whilst some of the figures are obviously imaginary.

Meryon in fact projected at this time a series of ten views of Bourges which he proposed to issue like the Paris set in album form (at ten francs a set). But only one other plate beside the two mentioned was completed, the "Musician's House," known as the *Ancienne Habitation à Bourges*, done in 1860 (L.D. and W.56).

One plate of 1854 remains to be mentioned—the *Entrance to the French Capuchin Convent at Athens* (L.D. and W.61), a reduced copy with slight modifications of a plate by Le Roy, published in 1758. Meryon had visited this spot during his Mediterranean voyage.

In 1855 he made only four etchings. The *Salle des Pas Perdus* (L.D. and W.48), is a copy of a rare print by J. A. Du Cerceau, 1600, lent to him by Destailleur, his architect friend. It was done on a pewter plate and shows us the antechamber, a lobby where advocates and their clients promenade and converse whilst waiting for their case to be called. Meryon admired the drawing in it for it reminded him, he said, of that in Zeeman's and Marc Antonio's works, a

somewhat far-fetched comparison, we may think. The *Pont-au-Change about 1784* (L.D. and W.47), was done from a drawing by Nicolle also lent him by Destailleur, and is a plate which must have greatly impressed Muirhead Bone, since many of his drypoints recall it. *Le Pont Neuf and La Samaritaine* (L.D. and W.46), seen from below an arch of the Pont au Change, is also from a drawing by Nicolle in Monsieur Destailleur's collection. Finally *La Loi Solaire* (L.D. and W.93), to which we shall refer later.

Dating from 1856 we have five plates: the *Château of Chenonceau*, of which Meryon made two etchings (L.D. and W.57 and 58), slightly different in size and strength, both published as illustrations to books on this Château, and both copied from an engraving by J. A. Du Cerceau; the *San Francisco*, his largest plate (L.D. and W.73), one which gave him an immense amount of trouble both in the composition and the biting, based as it had to be on an incomplete series of five daguerrotypes furnished to him by the patrons who commissioned the plate, two bankers, Messrs. Bayerque and Pioche, who paid him 1,200 francs for it; finally three plates, the *Portrait of Casimir Le Conte* (L.D. and W.77), the *Verses to the Pilot of Tonga*, the first of the etchings bearing reference to his youthful voyages in the South Seas (L.D. and W.64), and *La Loi Lunaire* (L.D. and W.91); to all these we shall return.

In 1857 Meryon was invited by the Duc d'Arenberg to visit him at Enghien in Belgium, to etch views of the Château and grounds and to give him a much needed change of air and scene. But he was unable to work and returned to Paris in March, 1858, in a condition bordering on delirium. Delâtre the printer looked after him as well as he could, and there were other friends who visited him when he would allow them to do so. There is a charcoal portrait of him done in May, 1858 by Léopold Flameng who was visiting him, which shows Meryon sitting up in bed, his sharp features emaciated with self-imposed fasting. When the drawing was finished Meryon asked to see it, sprang out of bed in fact, and attempted to tear up the drawing; Flameng had to make a speedy exit. Next day Meryon was carried off, at the instigation of friends, to the asylum at Charenton just outside Paris, where, it was believed, he would probably recover under the regular discipline and better fare. Here he was gentle and polite, and in fact made one etching, the *Chateau de Pierrefonds* (L.D. and W.59), from a sketch by Viollet-Le-Duc who had taken the drawing to show to Meryon. By August, 1859, he was so much better that he left the Asylum for three weeks' leave and did not go back again until 1866.

In 1860 he made seven etchings:—the *Ancienne Habitation à Bourges* of which we have already spoken; the *Passerelle du Pont-au-Change, after the fire of 1621* (L.D. and W.50), done from a drawing by Stefano della Bella then in Monsieur Bonnardot's collection and later in Mr. Macgeorge's collection; the *Rue Pirouette* (L.D. and W.49), an improvement of a drawing made at Meryon's request by Monsieur Laurence, as Meryon by this time had begun to dread working in the streets; the *Chevet de St. Martin-sur-Renelle* (L.D. and W.60),

a plate commissioned by Monsieur Sensier, being a facsimile of a drawing by Langlois the Norman architect and antiquary, 1837; the *Presentation of Valerius Maximus, a printer to King Louis XI* (L.D. and W.94), done for Monsieur Niel after a miniature in his possession; and finally the *Head of a New Holland Dog* (L.D. and W.65), and the *Malingre Cryptogame* (L.D. and W.66), two original plates reminiscent of his youthful voyages in the South Seas and intended to form part of a projected series of New Zealand plates based on the drawings he had made during those voyages and had kept with some such project always in mind, his intention being to accompany them with text compiled from his journals of those years, a project that fell through from lack of financial support once again.

The pencil sketch of the *Head of a New Holland dog* is in the British Museum, which also possesses the etching itself. The dog was the pet of the ship on which Meryon visited the South Seas. The *Malingre Cryptogame* is a curious and interesting little plate of which the pencil sketch is also in the British Museum. "The sketch was made," says Meryon "one morning when I was taking a walk at Akaroa. I saw this poor little fungus, distorted in form, pitifully pinched and puny. Its ephemeral existence typified to me so entirely the inclemency, and at the same time the whimsicality, of an incomplete and sickly creation, that I determined it should have a place in these souvenirs of my voyage."

We have travelled a long way already from the magnificent Paris plates. For a time it looked as though Meryon would be unable to undertake any but those plates we have just been reviewing which were commissioned by various friends anxious to help him, and, as a fact, apart from the etchings of New Zealand subjects based on his own early drawings, to which we are about to refer, there is nothing more to come that can possibly enhance his reputation. When we have seen these New Zealand plates, therefore, we may draw a speedy veil over most of the remaining work.

The New Zealand plates were mostly produced between 1863 and 1866. In 1863 there were the *Banks Peninsula; Charcoal-burners' Point, Akaroa, with fishermen with a Seine net* (L.D. and W.69); the *Oceania; Fishing by the Palm Islands in the Uea or Wallis Group* (L.D. and W.68), and the *Great Native Hut on the road from Ballade to Poepo* (L.D. and W.67). All these were exhibited at the Salon in 1863 or 1864, and, as we have seen, all are based on the pencil sketches made by Meryon when visiting those shores in 1845, some of which drawings were in the Macgeorge collection. There is some splendid etching in these plates, that of the distant land in the *Fishing by the Palm Islands* being specially commendable.

Two more of the New Zealand plates were completed in 1864, the *Little French Colony at Akaroa* (L.D. and W.71), and the *Native Barns at Akaroa* (L.D. and W.70), and the remaining three in 1866, the *Flying Proa of the Mulgrave Isles* (L.D. and W.74), a little print he often gave as an I.O.U. for meals received by him at this time at neighbouring cafés; the *Old Soldier-Settler's Hut at Akaroa* (L.D. and W.72), and the *Cover Design for the New Zealand set*

(L.D. and W.63), with its quaint bordering of fish and native implements of which many of his sketches are in the British Museum. The only other plate of this New Zealand series was the *Verses to the Pilot of Tonga* (L.D. and W.64), etched in 1856—a poem in praise of the skill of the 'Tonga pilot who safely navigated the ship through the treacherous narrows and across the seething bar of the coral reef.

Between 1855 and 1866 there are several plates of varying interest, not as yet mentioned. There is the *Tourelle de la rue de l'Ecole de Médecine (or Marat's House)* (L.D. and W.41), one of Meryon's own favourites, done in 1861. It takes its name from the house with the turret, the house where Marat was assassinated by Charlotte Corday. The figures seen in the sky in the early state symbolise Truth, Justice and oppressed Innocence.

There is the *Part of the City of Paris towards the end of the 17th Century* (L.D. and W.51), done in 1861 from a drawing in the collection of Monsieur Bonnardot, with which, however, Meryon has taken certain liberties, especially in the placing of the towers of Notre Dame and the corner of the Pump. There is the *Grand Châtelet, Paris, about 1780* (L.D. and W.52), also done in 1861 from an old drawing in Monsieur Bérard's collection; and the splendid *Rue des Chantres* (L.D. and W.42), etched in 1862. Of this latter Mr. Macgeorge possessed two studies. The spire seen in this splendid etching is that added by Viollet le Duc to Notre Dame a few years after Meryon had made his famous etching of the *Abside de Notre Dame*, which therefore does not show it. Héloïse lived in this street with her uncle, Canon Fulbert, but the house has long since disappeared.

The *College Henri IV* etched in 1864 (L.D. and W.43) is one of Meryon's most remarkable plates, giving a bird's eye view over the quarter where this school was situated. A considerable portion of this plate is conceived fantastically, but the rest is faithfully rendered. In some of the early states there are mountains and ships in the distance, later removed and replaced by houses. The quaint, fantastic figures in the foreground exist throughout all the states, an imperishable record of the ravages of Meryon's malady.

Also dating from 1864 is *Chevrier's Cold Baths* (L.D. and W.44), a plate commissioned by Le Secq, reminiscent for a moment of Meryon's splendid Paris plates; in 1865 he etched another well-known plate, the *Ministère de la Marine* (The Admiralty Building facing the Place de la Concorde) (L.D. and W.45), of the later state of which impressions, published by a French Etching Club, are fairly common. In it we see again in a flight of queer creatures, whales and the like, evidences of the derangement of Meryon's mind.

But we have seen his best work, and there remain to be mentioned hardly any plates possessing general interest. There were a few portrait-etchings in 1861 and 1862, of which the *Pierre Nivelles, Bishop of Luçon* (L.D. and W.81), done from an engraving by Michel Lasne, and the *Marie Bizeul* (L.D. and W.83), done from a photograph, and *Armand Guéraud* (L.D. and W.86), are typical. The

best of the portraits is, however, the *Casimir Le Conte* (L.D. and W.77), etched in 1856 from a drawing by Gustave Boulanger. There are other plates including the three acrostic plates—the *Rébus : Béranger* (L.D. and W.101), and the *Rébus : Morny* (L.D. and W.102), done in 1864 and 1866, and another, done in 1863; the *Little Prince Dito*, of 1864 (L.D. and W.99), which remained unpublished as it contained a veiled malevolent allusion to the Prince Imperial; a *Frontispiece to the catalogue of the engravings of Thomas de Leu* (L.D. and W.96); an address-card for his publisher Rochoux, etched on two plates so that parts could be printed in black and parts in red (L.D. and W.87); the verses to his master Bléry; verses to a ploughman and his horse; and three altogether unique plates, one the *Solar Law* (L.D. and W.93), and two versions of the *Lunar Law* (L.D. and W. 91 and 92), in the inscriptions on which Meryon gives us his views on the necessity of temperance and self-control, and of the beneficial effects of air and sunshine which he regarded as two of the principal essentials of life when posing for a moment as a social reformer (in the plates illustrating his “Lunar Laws” especially, where he sought to have enacted a law compelling men and women to sleep in an upright position, confined in a narrow framework specially constructed as shown in his second plate).

Nothing could prepare us better than these plates for the facts of his end. His mental disease increased; he became the subject of the most amazing hallucinations, and refused to receive his best friends or to be helped by them, although we are told his father was able to relieve his wants through the mediation of Meryon's sister to whom the artist was very much attached.

In October, 1866, shortly after he had etched for the French Government the plate of *The Old Louvre* (L.D. and W.53), (from Zeeman's painting now in the Louvre), he was taken once more to Charenton, where, recovering again to a certain extent, he was able to work a little, and wrote many long letters, mostly somewhat incoherent, it is true. He was taken to see the Universal Exhibition where some of his etchings were exhibited, but a violent storm as he was returning caused his reason to give way again, and he never recovered from the shock. His delusions increased. He believed himself to be Christ held captive by the Pharisees, and refused, as he believed there was not enough food in the world, to eat bread and thus rob the poor of their sustenance. His death was, in effect, the result of self-starvation, and took place on February 14th, 1868, in his forty-seventh year. He was buried affectionately by a group of friends, in the cemetery of Charenton St. Maurice just outside Paris, his old friend and shipmate De Salicis pronouncing an oration over the grave, and his friend Bracquemond the etcher providing a brass plate engraved with Meryon's name and a suitable inscription. The tomb is, alas, now in disrepair, and the brass plate has been removed and now stands in a corner of the cemetery-keeper's lodge. But though his tomb is deserted and sunken, his reputation lives on, revered and untarnished, spite of all his gentle critics, and of the hesitancy of those who are unable to distinguish between the

genius and the insanity in his work. Meryon's etchings of Paris have immortalised him, and among his others there are none that lack interest, either of technique or subject.

It would be impossible to overrate the influence of his Paris etchings. As Rembrandt has moulded all subsequent etchers of landscape and figures Meryon has influenced all etchers of buildings and streets, and we speak freely of "Meryonesque" subjects just as we do of "Rembrandtesque" effects. As Mr. Campbell Dodgson has said: "Fame was denied to Meryon whilst he lived, but posterity has done him homage that can meet no rebuff, and the sincerest flattery, that of imitation, has been offered to him by a generation of etchers that was being born whilst he was relaxing by degrees his imperfect grasp of life."

Principally, however, his fame rests on the subtle imaginative quality and the human and personal element in his work, which make it unique in the annals of etching and render his plates more than views. His best etchings are the embodiment of a spirit, the spirit of the past, and at the same time a comment upon the strangeness of human life and the ways of mankind.

In Wedmore's words, "Spirits spoke to him, only too well, in every street of Paris. The stones were alive. And in every building of beauty or age, at every dark street-corner, in every bridge that spanned the breadth of the Seine, in every aspect of wandering water or passing sky, there was something to recall to him the fortunes of the solitary, of the disappointed, of the desperate, of the poor. His sense of these strange fortunes—of their mystery and tragedy—he has woven inseparably into the fabric of his work."

These qualities, coupled with a manual dexterity likewise unsurpassed, make his etched work the greatest and most profoundly original of any since Rembrandt's.

Extensive public collections of Meryon's etchings are to be found in the British Museum, in the Victoria and Albert Museum, in the National Gallery of Scotland, in the Bibliothèque Nationale in Paris, in Berlin and Dresden, in the Art Institute of Chicago, and in the New York Public Library; the Athenæum Club in London possesses, as a bequest of a former member, Colonel F. A. Lucas, a magnificent series of the Paris etchings, and Pembroke College, Cambridge, a number given by a member of the Meryon family. In addition to these there are several good private collections in Europe and America, though none can ever again be as extensive and complete as was the late Mr. B. B. Macgeorge's in Glasgow. The study of the prints will be materially assisted by reference to the catalogues already mentioned and to the various articles written upon Meryon's work by such noted critics and admirers as Hamerton, Seymour Haden and Sir Frederick Wedmore (whose catalogue in the Second Edition of 1892 should also be consulted), whilst Mr. Hugh Stokes' book on Meryon's etchings in Messrs. Newnes' Art Library series, and Mr. Campbell Dodgson's book, published by Messrs. Halton and Truscott Smith, are sufficient for general purposes.

CORRESPONDENCE

THE HARROW GASOMETER

With reference to your note regarding the above in the *Journal* of August 29th, some three or four years ago the Guernsey Gas Company erected a new gasometer of the usual design, which formed a very prominent feature in the background of Belle Greve Bay. It was then painted green and trees planted about it. Now one hardly notices it and those who are unaware it is there, probably do not notice it at all. The method seems a very simple and inexpensive way of combining utility and natural beauty.

C. I. DAVIDSON.

OBITUARY.

SIR ASTON WEBB, G.C.V.O., C.B., R.A., F.R.I.B.A.—Sir Aston Webb, who died on August 21st at the age of 81, became a Fellow of the Society a quarter of a century ago, in 1905, and during that time always maintained a close connection with it. He frequently presided at meetings when papers on architectural and artistic matters were read and in 1922 was elected a Vice-President. In 1927 the Society conferred upon him the highest distinction in its gift by the award of the Albert Medal "for distinguished services to Architecture."

Born in London on 22nd May, 1849, he was the eldest son of Edward Webb, engraver and water-colour painter. He early shewed his ability by winning the Pugin travelling studentship of the Royal Institute of British Architects, and in 1884, when he was only 35 years of age became President of the Architectural Association. In 1902 he was elected President of the Royal Institute of British Architects, which further honoured him in 1905 by recommending him for the Royal Gold Medal awarded for the promotion of Architecture. Sir Aston was also selected by the American Institute of Architects in 1907 as the first recipient of the gold medal instituted in that year to celebrate their jubilee. His artistic gifts received special recognition by his election in 1899 as an Associate of the Royal Academy, of which he became a full member in 1903, and in 1919 the Academy conferred upon him a very exceptional honour, which had only once previously been given to an architect, by electing him as their President.

Among the numerous buildings for which he was responsible either solely or in collaboration with other architects, may be mentioned the new facade to Buckingham Palace, the Admiralty Arch, Charing Cross, the Imperial College of Science and Technology and the new Victoria and Albert Museum at South Kensington, the Britannia Royal Naval College, Dartmouth; the Royal College of Science, Dublin, and many other private and commercial buildings.

THE DUKE OF NORTHUMBERLAND, K.G., C.B.E., M.V.O.—By the death of the Duke of Northumberland, which took place on August 24th at the early age of 50, the county has lost one of the most strongly outlined personalities in its public life. His political standpoint is well-known and full justice has been done in the obituary notices, which have appeared in all the leading newspapers, to the outstanding energy and concentration which were such marked features of his character. He was a great fighter and this characteristic won him the respect of those who politically were most opposed to him. In addition to being a strong party man he was keenly interested in scientific research and was President of the Royal Institution and of the Institution of Naval Architects. He was a Vice-President of the Royal Society of Arts for the Session 1926-27.

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No. 4061

FRIDAY, SEPTEMBER 19th, 1930

VOL. LXXXVIII

All Communications for the Society should be addressed to the Secretary, John Street, Adelphi, W.C.2.

NOTES OF THE WEEK

"Exactly what proportion of our population is 'industrial urban' I do not know, but, in any case, God help it!"

Clough Williams-Ellis.

Bungalowmania.—Under the heading "Bungalophobia," Mr. Stanley Casson writes a very interesting and provocative article in *The Spectator* this week on the subject of Bungalows. He begins the article by saying:—"I cannot understand this prejudice against bungalows," and goes on to describe a bungalow which he built for himself ten years ago on a beautiful sloping wooded hillside steep which he had selected with great care on the North Cornish coast. We presume we are right in assuming that Mr. Stanley Casson is a gentleman of leisure and culture who, as he says, "loves the beauty of the countryside," but who has not, during the last ten years, found it necessary to stray far afield from his beauty spot and the ideal bungalow which he describes as having built for himself without the aid of any professional advice "for the cost of a motor car." May we suggest that he takes a brief holiday from his isolated and beautiful bungalow, and visits the building outcrops of most of our medieval towns? He will then realise how apt Dean Inge's generic description of modern estate building is. A single bungalow on an elevated site, set in a woodland, is a very different thing from the repetition of square boxes with asbestos roofs at varying angles on an open site. There is the estate where the bungalows or houses or both are built by one or two contractors, where the unit is repeated with tireless monotony, and possibly even worse is the estate where the sites are sold to individual purchasers, and each unit is put up to the purchaser's fancy. In both cases there is no mind to control either materials or the relationships of the forms, and the results are indescribable. Mr. Casson says "the architects and divines must

stop nagging and get to business," and again refers to what he calls his individual "growth." He says they must design different types for different regions, as if this was a new idea, and suggests, what is really not the fact, that the architect has control. We should like Mr. Casson's definition of an "expensive architect." In the matter of cottage building the best architect must obviously be the most economic, and it would be well here to remind the public that the charges of architects are uniform. We note *The Spectator* has asked Mr. Clough Williams-Ellis to reply to Mr. Casson this week, and he will, no doubt, deal effectively with this very important question of the control by the architectural mind of the manner of building in the various districts. Mr. Williams-Ellis is challenged to show Mr. Casson a beautiful and modern bungalow capable of being repeated innumerable times without offence. We are sure he will have no difficulty in doing so. But this has no bearing on the question of the preservation of Rural England any more than Mr. Casson's experiment has. They are two isolated and individual cases. We were looking through the recently issued catalogue of Messrs. Batsford, and were astonished at the number of books which have been published by them illustrating the domestic architecture of almost every county, not to speak of books giving fullest details of the manner of their making, and of good modern examples based on their traditional character. These books must have a considerable sale, but apparently the public regards them as exemplars of a lost art instead of using them as practical illustrations of the art of building. Every local council should possess and study the illustrations in these books, and learn how artless and economic good building is. It is true that buildings of one storey, unfortunately called bungalows, apparently were not much in favour up to the time of the Great War, for the very good reason that it is not the type of building which is economic as a general rule, but if people prefer to have their rooms all on one floor, there should be no difficulty in making this type of dwelling as attractive as any other. Mr. Casson touches the root of the matter when he advocates the use of local materials. Very little harm will be done to Rural England if the authorities in the various districts will prove, as they can, that the use of these is the real solution of the problem. Every kind of argument seems to be advanced to prove that these materials which are to hand cannot now be used, on the ground of expense. The beauty of England is so varied and irresponsible that we are ceasing to have any faith in regional and town planning. Besides, it is no use having a plan of control unless there is the power to control in each case, by one mind, the actualities that emerge from this plan. The architect cannot be employed (Mr. Casson suggests this) on each individual unit of a building estate, but he is needed vitally in so far as he has real vision to establish the correct details of standardisation and the general grouping of the units into some ordered and beautiful pattern. For this work he surely cannot be too highly paid. A member of the Council of the Society, the Hon. Stafford Cripps, has set an example in the Cotswolds which must have far-reaching effects. This experiment is referred to in this week's *Builder* as follows :—

RURAL CONTROL. We wish the public-spirited efforts at Witney were being emulated all over the country. We understand that all developments there are subject to reasonable control and the interest of the community. In effect, the local authority is doing what it never had the power to do before, to hold a watching brief on behalf of the community over all developments within its area to see that this is mutually beneficial to other owners and residents and to the community as a whole. Before any building, rebuilding or essential alteration can be proceeded with, plans must now be submitted to and approved by the Joint Town-planning Committee and also two at least of the more important elevations. It will, indeed, be a matter for congratulation if it may be asserted that the *laissez-faire* method of building, which has for long been consistently ruining the amenities of our towns and villages, is at an end.

We are sure that Mr. Cripps will be very gratified at the congratulations offered by *The Builder* on the satisfactory result of his experiment.

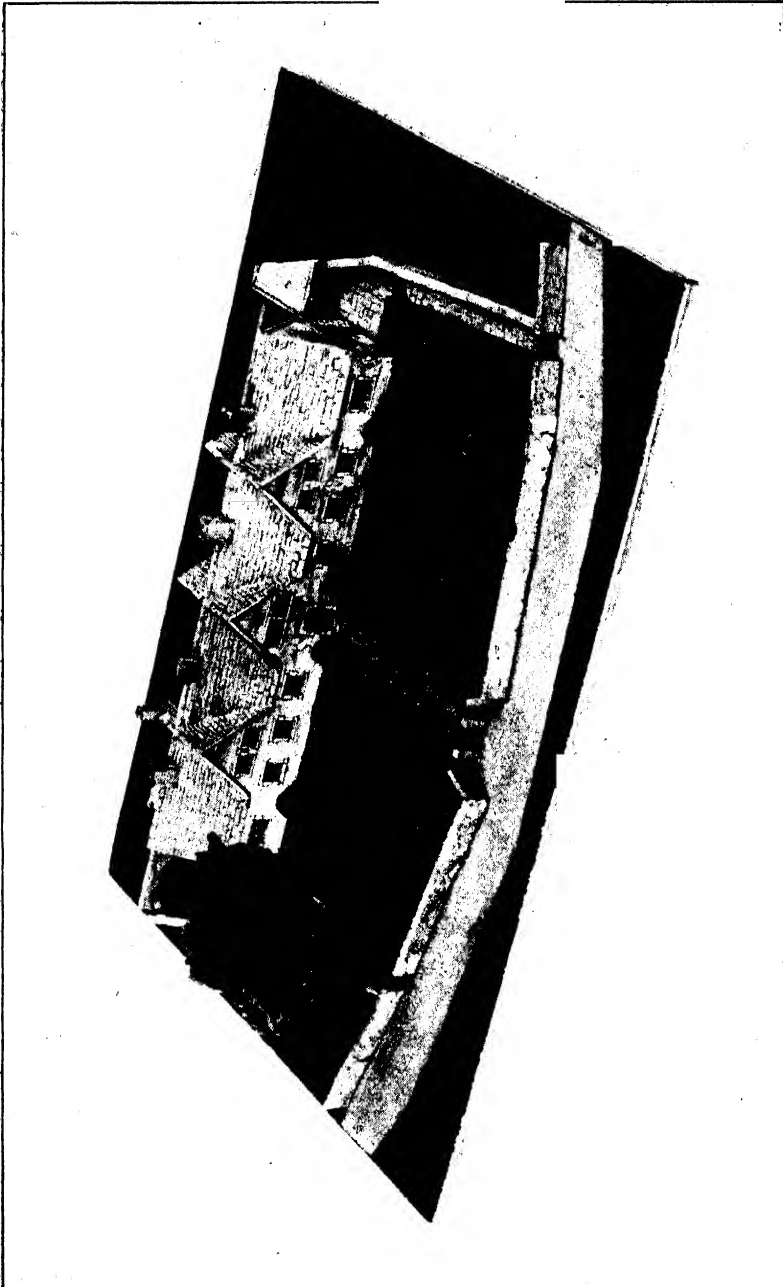
St. John's College.—What decision have the Battersea Town Council come to with regard to the fate of this beautiful house? We dread seeing the demolishers at work, and we are hoping sincerely that better counsels will prevail. The possibility of amalgamating the house into the Housing Scheme was suggested in a previous number. Possibly the Council and their Architects are pursuing the idea. Without any information as to the number of tenants to be housed, we illustrate the possibility which might be worth consideration, in some little sketches made by Mr. Harvey, the well-known artist.

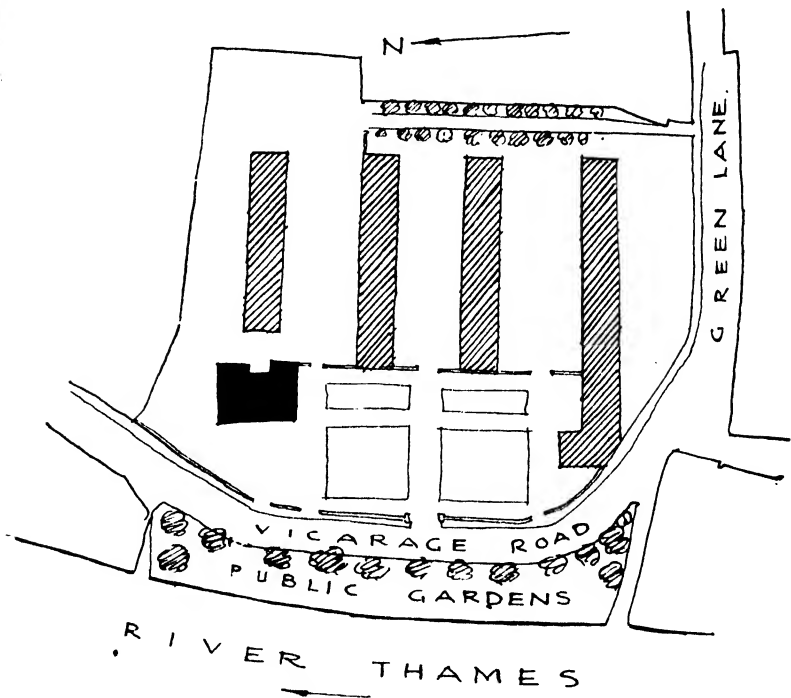
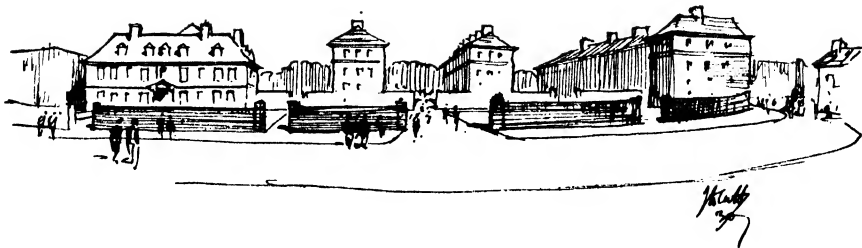
Tin Cans.—We see that England is to be made merrier by the development of the British Canning industry. Wherever fruit and vegetables are grown on a sufficiently large scale, British canners will erect a factory to take the crops. This will be a new menace to the beauty of England. Surely a merrier policy would be to encourage the individual bottling and preserving of fresh fruits. It is appalling to go into a village grocer's shop and see nothing but tinned fruit and food of all sorts; to go into a village inn and ask for fresh or even stewed fruit and be offered tinned fruit, when fresh fruit is rotting in the orchards.

Merry England.—We quote the following from a letter addressed to *The Times* by Mr. Houston Hart. We wish we had space to quote the whole letter.

May I burden your columns with a few observations of an American newspaper publisher who will sail home Saturday somewhat disappointed and a little disillusioned about Great Britain, the "merry England" through which I toured on bicycle as a schoolboy 20 years ago, but which I find to-day a very different country?

Faced with great problems on every hand which can be solved only by hard work and British leadership, my impression is that the Press, particularly the popular Press, is wasting its energy and dissipating its influence in what appears to be nothing more or less than an anti-American campaign. I am surprised to find in newspapers of great national circulation irritating, pin-pricking criticism of America, over-emphasis of our country's weaknesses, and minimising of our real achievements. Our industries are attacked and everything short of open





boycott is advocated against American products. A member of Parliament is held up to scorn because he owns an American motor-car. The public is warned against the octopus of Hollywood films. Our financiers are Shylocks. Important and significant news of America goes neglected.

The effects of all this are far-reaching. I had had the pleasure and privilege of being invited into several homes in this country, and there I found the warmest feeling toward the individual American, but a lack of understanding of the United States and American public opinion.

If as the years go by I find it possible to return to this country again, I hope to see the "merry England" I knew as a youth, not the country I have just visited.

In connection with this we were reminded of the constant references in the press to the removal to America of so many old buildings and interesting decorative features of our traditional buildings. The demolition of any interesting building is generally heralded by the comment that "it has been bought for transport to America." The real facts, of course, are that it has been bought first by a dealer with a view of persuading the Americans to purchase it through their agents over there at the highest price. The scare about Cockington Forge—a beautiful picture of which *The Daily Telegraph* published last week—was obviously absurd. No amount of ingenuity could recreate these materials on the other side of the Atlantic into such a picture. The beauty of this group of cottages, seen on the rising hill against the background of woodlands, is something which only time and nature could reproduce. Even if the owner desired to sell it (which does not appear to be the case) he has only the power to destroy it. These press alarms with regard to American purchases must be detrimental to relationships with America, which it is so desirable should be cordial.

Road Disfigurement.—A correspondent asks if any action can be taken by the County Council (Hampshire, in particular) in regard to the following :—
(1) Last year, on a Sunday, all the beautiful by-roads had their surface and even fenced walls at any convenient spot, painted a raucous blue colour. This has been repeated this year in red as well as blue. Apart from the question of whether these beautiful lanes should be at the mercy of motor cycle racers, have these organisations any right to bespatter the lanes in this way ?

(2) Early in the summer gravel and tar tubs were dumped down all along the lanes indiscriminately, and the pleasant continuity of the grass borders along the hedges was permanently destroyed by these gravel dumps. These still remain an eyesore, but apparently the tubs are empty, and the necessity for the gravel seems to have gone. Perhaps now that the Council has taken over the roads these necessities will be arranged with some organised seemliness.

A Note from Canada.—A Canadian correspondent sends us some interesting notes about the industrial arts in Western Canada. She speaks of a very interesting production, *The Year Book of the Arts in Canada*, edited by Bertram Brooker, the first venture of a united review of Canadian arts, giving

information as to the minds at work on that vast unwieldy country. Everyone seems apparently seething with ideas but working against tremendous odds. Describing the little furnished flat from which the letter was written, and where the bed is at the bottom of the sideboard and rolls out, the bookshelves above, and china above that, the kitchen door clicks open as you touch it, and clicks back again ; everything is lined in white china porcelain ; perpetual ice at top of larder cupboard, which is also white and shiny. The comment on all this is that " they call it civilisation out here." Our correspondent does not. She thinks it is all rather a good idea, but wishes that they would get the real things first. Does a country that has every gadget, and boiling water everywhere all to time, begin at the wrong end ? Is all this tangible mechanical civilisation blunting and stupefying ? She thinks, in a way, it is.

Blandford.—We have so frequently called attention to the town of Blandford as the birthplace of Alfred Stevens that we are interested in a correspondent's letter to *The Builder* urging the importance of exercising control over its new buildings and advertisements. It is such a typical 18th century market town and so full of characteristic buildings, that the authorities would do well, if they really appreciate its quite unique values, to consider how this can be most effectively bypassed. The traffic through Blandford from Salisbury is out of all proportion to its size, and any attempts to round off corners and set back individual buildings, with an eye to the future, will be fatal. We heard rumours that one particular corner (enclosing a particularly attractive old house) had been acquired by the local authorities, and obviously, unless the town is bypassed, this corner is particularly dangerous and will have to go. We hope the town which produced so great an artist as Alfred Stevens will consider matters of this kind with some vision

NOTICE

COMPETITION OF INDUSTRIAL DESIGNS

SPECIAL COMPETITION FOR DESIGNS IN BEATL

A special section of the Society's Competition of Industrial Designs will be held in November next. Three first prizes of £100 each, three second prizes of £50 each, and three third prizes of £25 each, will be offered for designs for articles to be manufactured in Beatl Ware. The competition is divided into three sub-sections : (a) Designs for Door Furniture, Electric Lighting Parts, and Bell Pushes ; (b) Designs for Lavatory and Bathroom Equipment ; and (c) Designs for New Uses for Beatl.

The competition is open to all, and in view of the substantial prizes and the novelty of the subjects, it is hoped that the number of candidates will be large.

Particulars of the competition can now be obtained on application to the Secretary, Royal Society of Arts, John Street, Adelphi, W.C.2.

PROCEEDINGS OF THE SOCIETY

CANTOR LECTURES

THREE MASTER ETCHERS: REMBRANDT, MERYON, WHISTLER

BY HAROLD J. L. WRIGHT

LECTURE III.—*Delivered February 3rd, 1930*THE ETCHINGS AND DRYPOINTS OF JAMES ABBOTT MCNEILL
WHISTLER (1834—1903)

The last of the three Master-Etchers whose work we are reviewing in these lectures is James McNeill Whistler—last but not least, for there are some, the late Joseph Pennell for instance, in whose opinion his etchings take precedence of those of Rembrandt and Meryon. But we must see for ourselves, and form our own conclusions.

James Abbott Whistler was the son of Major George Washington and Anna Matilda Whistler, and was born on July 10th, 1834, at Lowell, Massachusetts. The house in which he was born still stands, and is now a Whistler Memorial Museum. His father was a descendant of an Irish branch of a Berkshire family, which perhaps accounts for some of the artist's flashes of wit and temper, and for his conversational brilliance. He was the eldest of four sons, offspring of his father's second marriage. His mother was a doctor's daughter, a Miss McNeill of Wilmington, North Carolina. His father, who was for a time chief engineer of the Western Railroad of Massachusetts, was offered and accepted in 1842 the important post of Consulting Engineer to the Imperial Russian Commission building the first railway between St. Petersburg (as it then was) and Moscow, and in the following year Mrs. Whistler left Boston to join her husband in St. Petersburg, taking with her her step-daughter Deborah, and three of her sons, including James, the fourth son having died. One of the sons, Charles, died on the voyage over.

James was a delicate boy, somewhat subject to rheumatic attacks, and had a passion for drawing at all times, being constantly seen sketching. It is said that already at the age of ten he used to design his own frames for these little sketches. In 1845 he commenced taking drawing lessons at the Imperial Academy of Fine Arts in St. Petersburg. Two years later, in 1847, Mrs. Whistler and the children visited England, where in that year the step-daughter Deborah met and married Seymour Haden. The visit was renewed in 1848, and on his mother's return to St. Petersburg this time Whistler stayed on with the Haden family at their house at 62 Sloane Street. Major Whistler died in April, 1849, following an attack of cholera, and Mrs. Whistler returned to London for a short time, sailing in July for New York and taking James and his brother back with her, eventually sending the boys to school in Connecticut. Whistler was a general favourite at school

where he excelled in map-making and was, it is said, always sketching. Both the McNeills and the Whistlers had been soldiering families, and in accordance with the family tradition Whistler was entered as a cadet at West Point Academy in July, 1851, being then seventeen. Here he remained three years, distinguishing himself in drawing, but in little else. He left West Point in June, 1854, discharged, it is said, for deficiency in his knowledge of chemistry, having declared in examination that silicon was a gas. We may thank God Whistler thought it was, or probably we should never have had these etchings. After a short time, through the influence of Jefferson Davis, Secretary for War, Whistler was appointed to the drawing office in the U.S. Coast Survey in Washington, at a salary of a dollar and a half a day, entering upon his new duties in November, 1854. Here he received the finest possible ground in the technical side of etching—the “cuisine” of etching, as it has been called. His duties consisted in drawing and etching maps and plans, work which demanded minute accuracy and undoubtedly laid the firm basis for all his future achievements. Two plates partly etched by him there have survived, and enable us to judge his early skill, the *Coast Survey plates, Numbers 1 and 2* (K. 1 and app.1).^{*} On the margins of one there are fascinating little figures etched by him as he tried the point of his needle prior to etching the main design. It has been said, without foundation, however, that these practices got him into trouble with the authorities who objected to this waste of Government copper; but in reality his artistic temperament was too strong to submit to restraint for long, and he resigned, of his own accord, in February, 1855, determined to take up art as a profession now that he was nearing his majority. In this determination he sailed for Europe, never afterwards returning to America.

Well equipped with fluent French which he had learnt whilst in Russia, and knowing that Paris was then the centre of the arts, he made straight for Paris, with an allowance of seventy pounds a year. There, in Gleyre's studio, then the foremost of its kind, he started to learn to paint; for it was a painter he would become, just as we saw Meryon and Rembrandt had aspired to be. He met several men whose names have since become household words in art—Poynter, for instance, and Du Maurier, in whose novel, “Trilby,” we are given a peep into the life in Gleyre's studio, though the scenes are somewhat exaggerated. There was Delannoy also, less known perhaps, but the companion of Whistler in many financial crises and jovial escapades, and also of his walking and sketching tour in Alsace in 1858, the tour which resulted in the publication of Whistler's first set of etchings: “Twelve Etchings from Nature” (the French set, as it is called), first published in Paris in 1858, although isolated plates had been made before this time. Some of the etchings in this set were never to be surpassed in their kind by any Whistler etched later. Of the plates not included in this set, but doubtless etched before this time, we may glance at one, an early *self-portrait* (K.7). Among the best of the French set are *La Mère Gérard* (K.11), a study of an

^{*} The references are to Mr. E. G. Kennedy's illustrated catalogue raisonné of Whistler's etchings, published by the Grolier Club, New York, 1910.

old flower-seller who had her pitch outside the Luxembourg, and is said to have written verse, and to have given motherly advice to Whistler and his companions; *Liverdun* (K.16); the *Street at Saverne* (K.19), in some printings of which we seem to discover the beginnings of Whistler's later famous nocturnes; *The Unsafe Tenement* (K.17), in which, in its early state with the sky, there was a woman sweeping where the pitch-fork later stands; several plates in which we seem to see the influence of De Hoogh's paintings—*La Vieille aux Loques* (K.21), *La Marchande de Moutarde* (K.22), *The Rag Gatherers* (K.23), and above all, *The Kitchen* (K.24), which is considered the best of them.



The Kitchen.

The walking tour in Alsace, which, as we have seen, provided the chief material for this set, was perhaps the most Bohemian incident even in Whistler's varied career. Whistler and Delannoy got as far as Cologne and there woke up to the fact that they had spent out. After waiting ten days for remittances that failed to arrive, they arranged to leave Whistler's copper plates as security with the land-

lord of the inn, and started a long tramp back to Paris, supporting themselves en route by drawing portraits for meagre sums, and in other resourceful ways. They obtained help somewhere from an American Consul who had known Whistler's father; Delannoy also managed to borrow a small sum from the French Consul at Liège, and thus they accomplished their memorable journey.

About this time also, Whistler began a series of visits to London which were to culminate in residence there. During these visits, no doubt, he etched such plates as the *Seymour standing* (K.31), and *Annie, seated* (K.30) portraits of the Haden children, *Reading in bed* (K.28), *Reading by Lamplight* (K.32) and *The Music Room* (K.33), which give us further glimpses of the Hadens' home circle; in one little plate, *The Wine Glass* (K.27), we have Whistler attempting a still-life, and in others like *Greenwich Park* (K.35), rare depictions of landscapes with trees, subjects he found on the whole unattractive, despising Haden for his devotion to them.

After the issue of the French set, Whistler, possibly at the instigation of Legros or Manet or Bracquemond, and under the influence of Velasquez, seems to have been preoccupied with portrait etching or portraits in drypoint, for a time. Some of his best plates of this type date from 1859 and 1860, and for these his immediate friends posed—*Bibi Lalouette* (K.51) the son of the proprietor of his favourite restaurant at the time, *Drouet, a sculptor* (K.55), *Becquet, a 'cellist* (K.52), *Finette a dancer* (K.58), *Astruc, poet and sculptor* (K.53), editor of "L'Artiste," *Delâtre, a printer* (K.26), *Fumette, a model* (K.56), his nephew, *Arthur Seymour Haden* (K.61), *Henry Newnham Davis* (K.63)—the portrait known as "Mr. Mann" until its real identity was discovered and announced by Mr. John Charrington a few years ago—*Riault, a wood-engraver* (K.65), and *Axenfeld, an author* (K.64), whilst we have also his *Self-portrait* (K.54), in which he is seen wearing a broad-brimmed hat. Many of these plates are unsurpassed by any portrait etchings we know, and must take rank with the greatest. Indeed, by another of them, the *Annie Haden* (K.62), Whistler himself later said he was quite content to be judged. It is a print which justifies Pennell's saying that one form of art is as fine in its flower as any other. All these drypoints are exceedingly rare, the few impressions known being now mostly in museums.

In 1859 Whistler came to London, bringing with him Fantin Latour and Legros who were then struggling young painters like himself. They all found a willing and helpful patron in Seymour Haden, and were impressed and delighted by the table Haden kept. In this year, moreover, the French set was again published, this time (at two guineas a set) from Haden's house in Sloane Street, but with what success we are not told, although we know that Whistler's work, both in oils and etching, had begun to attract attention. It was in 1859 also that he went sketching at Wapping and Rotherhithe, from which visits sprang his now well known and greatly admired etchings forming the Thames series. Whistler came fully under the fascination of the river life, and even stayed at Wapping for a time so as to be near his subjects, merry parties of his friends foregathering with him of an evening

there when the day's work was done. As Pennell says, "He saw the river as no one had seen it before, its grime and glitter, its forests of shipping, its procession of barges, its grim warehouses, its huge docks, its little waterside inns." There were eleven of these plates of the Thames that year, including the superb *Black Lion Wharf* (K.42), *Tyzac, Whiteley & Co.* (K.41), *Thames Police* (K.44), *Thames Warehouses* (K.38), *Old Westminster Bridge* (K.39), *Limehouse* (K.40), *The Pool* (K.43),—*Black Lion Wharf's* great rival in the affection of collectors—*Longshoremen* (K.45)—a study of watermen in an inn—*The Limeburner* (K.46), *Billingsgate* (K.47), and another.

These masterly Thames etchings have been praised so often and so well that it is unnecessary to do more than endorse and accent the claims that have been made for them, at the same time dissociating ourselves from the attempts that have been made in some quarters to exalt these at the expense of Whistler's later work, since to do that, as Mr. Frank Rutter has pointed out, "is to confess an inability to follow the etcher in his higher flights in the Venice series, in which he seems to have brought etching to a pitch of lyrical beauty never before equalled." Let us regard these later plates as the complement of the earlier, a direct evolution from them, and a later flowering of an inherent principle. Whistler himself used to maintain that these Thames plates were but youthful performances, and when told that it was astonishing he could see such detail and put it on a copper plate, replied "H'm, that's what they all say."

Whistler went back to Paris late in 1859 for a time, and whilst there began an etching of *L'Île de la Cité* (K.60), which was never finished. It was, Pennell says, his only attempt to rival Meryon, and was not a success. Paris in reality was attracting him less and less and London more and more, and by 1860 we find him settled in London, sharing a studio, at first, with Du Maurier. He sent his painting "At the Piano," and five etchings, including three of the Thames subjects, to the Academy in that year; the painting was purchased by John Phillip the Academician, and the etchings were well noticed by the "Athenæum," so that the idea that Whistler waited a long time for recognition is seen to be erroneous. For the moment Whistler devoted more time to painting than to etching, though his famous plate of *Rotherhithe* (K.66), was etched in 1860. It has often been pointed out that in this etching there are already distinct traces of the influence of Japanese art on Whistler's style at this period, for in Paris, in 1856, Bracquemond had, so to speak, "discovered Japan" in a little volume of Hokusai's work used as packing in a case of porcelain and rescued by Delâtre the printer. Bracquemond communicated his enthusiasm to Whistler and other friends, Whistler bringing this enthusiasm to London with him. There is noticeable on the published state of this plate, a long scratch running down the centre of the sky from the top of the shed. Whistler used to say this was caused by a fright he received when working as usual on the plate in the open air, when a brick fell from a chimney-stack behind him and startled him so much that his etching-needle slipped and scratched the plate as we see. *Ben trovato?*



Black Lion Wharf.

It was in 1860 also that Whistler made some of the best of his drypoint portraits, as we have already seen. In 1861 there were more plates of the Thames, Upper and Lower, including two somewhat indifferent and poorly printed, "Hadenish" etchings, *The Punt* and *Sketching* (K.85 and 86), which were published by the Junior Etching Club in "Passages from Modern English Poets." Impressions of these are fairly common; their only interest for us is that it was whilst printing them at Messrs. Day & Son's that Whistler met the lad who was afterwards to be the Delâtre of England, the best professional printer of etchings we have yet had—Frederick Goulding.

Whistler was in Brittany painting during the summer of 1861, and his drypoint *The Forge* (K.68), dates from then. It was made at Perros Guirec. Other prints of 1861 were his drypoint head of *Jo* (K.77), another entitled *Jo's bent head* (K.78), and the etchings *Vauxhall Bridge* (K.70), *Wapping* (K.73), and *The Little Pool* (K.74). Of these latter there was a succession of states, impressions of some being used as invitation cards to clients of Mr. Edmund Thomas of Bond Street who had opened a shop for the sale of prints, Whistler's included. There is also a rare unfinished plate of *Westminster Bridge under construction* (K.72), which again shows the strong influence of Hokusai; and another very rare drypoint called *The Miser* (K.69), showing the interior of an almost bare room with a window at the far end, against which a figure is silhouetted. Though undated, the *Old Hungerford Bridge* (K.76) was also etched about now, and eventually formed one of the Thames set when published later. Two or three drypoint landscapes were also attempted, but came practically to nothing—*The Storm* (K.81), *The Encampment* (K.82), and *Landscape with a Fisherman* (K.83). They are very slight, and the plates were cancelled almost immediately, only one or two impressions being taken beforehand—of the last-mentioned plate none, in fact. There were other slight plates of varying merit, but of equal rarity for the same reasons.

In the portrait of *Ross Winans* (K.88), however, we have a more important plate, though it is not perhaps one of Whistler's best portraits, taken as a whole, the hand and sleeve being rather curiously drawn. The etching of *Rotherhithe* (K.66), was exhibited at the Academy in 1862, and in 1863 six prints were shown there—*Weary* (K.92), *Old Westminster Bridge*, *Old Hungerford Bridge*, *Becquet*, *The Forge*, and *The Pool*. Of these the only one new to us so far is the *Weary*, one of the most beautiful of all his drypoints and greatly coveted; the sense of languor is admirably conveyed, and there is great delicacy of feeling about the whole. In 1863 Whistler visited Holland with Legros, and greatly enjoyed the Rembrandts there. As a result of this visit we have his etching of *Amsterdam from the Tolhuis* (K.91), in which we seem to detect the beginning of a change in his style, a forsaking, for a moment, of closely finished detail for a freer handling.

By this time his etchings were becoming well-known. Those of the Thames plates had been shown in Paris at a dealer's gallery in 1862, and Baudelaire had



Weary.

written in glowing terms of them as " the profound and intricate poetry of a great capital," whilst in 1863 the British Museum purchased twelve for its Print Room. By this time also Whistler was living in Chelsea in Lindsay Row (now Cheyne Walk), and from his windows could see the river and the varying effects of dawn and dusk over it, with the lights of Cremorne blinking at night. It was here he met Walter and Harry Greaves, who taught him to row, so that he could stay out on the river for hours at night, or make excursions upon it at dawn, sketching inveterately the while. For the moment etching was practically forsaken, and even the dry-point was laid down most of the time ; for it was painting that now occupied Whistler's attention chiefly, his *Princesse du Pays de la Porcelaine* (now in the

Freer Collection in Washington along with the Peacock Room decorations made to accompany it when it passed into Leyland's possession); the *Lange Leizen*; *The Little White Girl*; *Old Battersea Bridge*; and others. It was at this time also (about 1867) that Whistler met Leyland, who became his chief patron for a while. Leyland was living then near Liverpool, and Whistler visited him there occasionally; one record of these visits is found in his plates *Speke Hall* (K.96)—Leyland's house, 1870, and *Shipping at Liverpool* (K.94), done in 1867, both more or less unfinished and both unsatisfactory. The *Speke Hall* passed through several states, and it would seem that Whistler was never satisfied with it.

Somewhere about now Whistler began to place his famous "butterfly" signature on his paintings and prints. It was evolved by him from his monogram "J.M.W." (for he had now dropped his Christian name "Abbott," and had adopted instead his mother's maiden name "McNeill.") This butterfly signature was intended to obviate the inharmonious effect of a large written signature on his pictures and prints. The world had another narrow escape of being robbed of Whistler's greatest etchings in 1866, when the old military blood in him sent him off to Valparaiso to indulge a queer whim of helping the South Americans against the Spaniards. He was present during the bombardment of Valparaiso but otherwise apparently accomplished nothing save a few fine paintings of the harbour. On his return to London late in 1866 he again settled down to paint, producing the first of those well-known "symphonies" and "nocturnes," which were to bring such comment and criticism, as well as eventual fame.

His association with the Leylands led not only to his painting the various members of the family, but to his making some drypoint portraits of them, and, incidentally, to a number of other drypoints, to a renewed lease of life for his drypoint, in fact. There are drypoint portraits of *Leyland* himself in a Van Dyck pose (K.102); of *Leyland's mother* seated in her arm-chair (K.103); of Mrs. Leyland in the plates entitled *The Velvet Dress* (K.105), and *The Little Velvet Dress* (K.106); of *Fanny Leyland* (K.108), seen in profile, seated; of *Elinor Leyland* (K.109), wearing a flounced frock; of *Florence Leyland* with her hoop (K.110); and other similar studies too numerous to mention. All these are of varying merit and importance; most of them passed through several states, in some of which it is interesting to trace the alterations Whistler was prompted to make in his somewhat unsatisfied search for finality. The quality of the drypoint in many of them is admirable; they can have yielded but few impressions, and are certainly very rare. One of the rarest of all is the *Portrait of the Artists's Mother* (K.97), of which only one impression before the cancellation of the plate is known—that formerly belonging to Mr. Mortimer Menpes, which was purchased for the late Mr. Freer by Mr. Gus Mayer, then of Obach & Company, when the Menpes collection was exhibited and sold. This print is now in the Freer Collection in Washington, bequeathed by Mr. Freer to the American nation. We shall agree it is a charming study of age, and that it has something of the same pathos and dignity as Whistler's well-known painting of his mother, now in the

Louvre, and of Rembrandt's paintings and etchings of age. Another drypoint of these years worth noticing is the *Model Resting* (K.100), since it is reminiscent of those charming Tanagra figures for which Whistler is known to have had a great admiration.

The drypoint series continued—it has been said that many of these plates were studies for pictures he was painting or proposed to paint. Time forbids reference to them all, but some should be mentioned. There is *Maude, standing* (K.114), a study of a favourite model, Maude Franklin; the *Model lying down* (K.121), one of the most obviously Oriental in feeling of all Whistler's prints, a very charming study; *A Lady at a window* (K.138), in a pose strongly reminiscent of that of the Burgomaster Six in Rembrandt's famous etching; *The Scotch Widow* (K.142), the *Swinburne* (K.136), begun, it is said, as a portrait of Leyland, but altered to resemble Swinburne as a result of Whistler's quarrel with Leyland (the work in this print reminding us of Vandyck's etchings); and finally the *Irving as Philip II of Spain* (K.171), reminiscent again of Van Dyck's paintings, Whistler's one experiment in reproducing a painting on copper, since, as he used to say "It is difficult for a hen to lay the same egg twice." The river, too, came in for attention. There are the *Shipbuilder's Yard* (K.146), almost pure Hokusai; the *Steamboats off the Tower* (K.149), *London Bridge* (K.153), *Price's Candle Works* (K.154), and particularly the *Battersea: Dawn* (K.155), where we see Whistler attempting something of a nocturne effect and giving vent to the poetry in him, that poetry which led him to write his well-known passage on this same subject of the Evening River in his "Ten o'Clock" lectures, a passage eminently worth quoting:—"And when the evening mist clothes the riverside with poetry, as with a veil, and the poor buildings lose themselves in the dim sky, and the tall chimneys become campanili, and the warehouses are palaces in the night, and the whole city hangs in the heaven, and fairyland is before us—then the wayfarer hastens home; the working man and the cultured one, the wise man and the one of pleasure, cease to understand, as they have ceased to see, and Nature, who, for once, has sung in tune, sings her exquisite song to the artist alone, her son and her master—her son in that he loves her, her master in that he knows her."

No wonder that Max Beerbohm has dwelt on Whistler's gifts as a writer.

Other Thames plates of these years are more or less sketchy, with the exception of the *Free Trade Wharf* (K.163) and *Little Putney* (K.179) etchings published by the Fine Art Society. Most of the drypoints we have mentioned remained unpublished and were apparently never brought to what most of us would regard as a finished state. They are very rare, the British Museum possessing only about eight of them; the Victoria and Albert Museum also has a few, portraits mostly. Sets of fifty-seven impressions from the cancelled plates of many of these drypoints were issued by the Fine Art Society in 1879. Of seven of these cancelled plates no impressions taken before the cancellation of the plate have survived. About 1875 Whistler turned to etching again, and we have little plates of views in and around Smithfield, Clare Market and Temple Bar, which are interesting now,

not alone for their etching qualities, but also as topographical records. It was a period of transition in his etching style, intermediate between that of the Thames plates and the Venetian plates that were still to come. If we look carefully, we may see him employing a different shading here and there—on the surface of walls, for instance. This is particularly noticeable in the *Adam and Eve Tavern, Old Chelsea* (K.175). *The Large Pool* (K.174), is a more definite precursor of the great Venice plates, especially in its breadth of treatment and its fine composition; so are the *Old Battersea Bridge* (K.177), and the *Old Putney Bridge* (K.178), which the Fine Art Society issued about this time at six guineas each.

By now Whistler's etchings had become well known, and there was a distinct, though not perhaps an extensive market for them. After Constantine Ionides, who first owned the plates, had printed for himself a hundred sets, the Thames etchings of 1859 had been gathered into a series, which was published in a portfolio by Messrs. Ellis and Green of Bond Street in 1871, as "Sixteen Etchings of Scenes on the Thames." Later the plates passed into the possession of the Fine Art Society who sold unsigned sets in portfolios at fourteen guineas a set, or single plates at from half-a-guinea to two-and-a-half guineas. Finally Frederick Keppel of New York bought the plates, had the steel-facing on them removed, and had Goulding print an edition of each before destroying them. Various etchings were purchased at this time also by the British Museum to extend its representation of them, and by Sir Richard Holmes for the Royal Library at Windsor.

Fifty etchings were shown by Whistler at his first "one-man show" in Pall Mall in June, 1874, in which year also the first catalogue of Whistler's etchings and drypoints was issued by Mr. Ralph Thomas in an edition of fifty copies, with Percy Thomas's etched portrait of Whistler as frontispiece. The time was ripe, therefore, for a more systematic publication of any etchings Whistler could be prevailed upon to undertake, and in 1879 the Fine Art Society commissioned him, at his own suggestion, to proceed to Venice and make a series of twelve etchings there, to be delivered within three months. His recent libel action against Ruskin (November, 1878, "damages one farthing") had made him bankrupt, and in addition had made it difficult to sell his misunderstood pictures for the moment; he was therefore forced to fall back on his etchings which had always been well received. It is an ill wind that blows nobody any good, and in this instance it was posterity that was to benefit, for we have inherited the most magnificent series of etchings other than Rembrandt's that the world has yet seen. They were not done in anything like the stipulated three months. Whistler stayed on in Venice during almost the whole of 1880, as he settled only slowly to work there; but when he returned he brought back with him forty plates, besides a number of pastels and paintings. From these forty plates the twelve to be published by the Fine Art Society were selected, the remainder being put aside for the moment, some of them being published later by Messrs. Dowdeswell, as we shall see.

The plates were etched in Venice, many of them from the open windows of his various rooms—some of them were bitten, it is said, in a little bath placed on the

top of a chest of drawers, the acid spilling over during the process, and running down amongst his shirts, ruining these. Only a few proofs were printed from the plates in Venice as Whistler had only the use of an old wooden press. Later, in London, he printed them more effectively and harmoniously. Indeed, it required Whistler's printing to bring out what he wanted from these plates. They were etched in a new style—"sophisticated," Mr. Lumsden terms it—in any event so new that when exhibited later they completely puzzled the critics who wrote most amazing things about them, opinions which some of them to their credit recanted later. Accustomed to these etchings as we doubtless are, it is difficult for us to see how the critics could have fallen foul of them, since they would seem in many respects an advance on what Whistler had been doing. There is more life in them than in his earlier plates; the lines are fewer and more nervous and delicate, as a rule. But certainly the artist's own inking of the plates was vital to their success. Without the superficial tones he gave them they would often have been ghosts. For this retroussage of the Venice plates Whistler has been much criticised by those who maintain that such tones should always be obtained in an etching from the lines themselves. On the other hand, his economy of line and his gift of elimination of unessentials has been highly praised, and certainly his printing has been flattered by imitation. Thus we have conflicting schools of Whistler enthusiasts, those who prefer his cleanly etched earlier plates, printed "nature" as the French say, and those who prefer the beautiful, painting-like effects seen in the finest of the Venetian prints. The question will never be settled. Let us abandon ourselves, therefore, to the enjoyment of them all in their season.

The first series of twelve Venetian plates was shown at the Fine Art Society's Gallery in December 1880, a hundred sets at fifty guineas each being advertised for sale. "The critics" says Pennell, "could see nothing in them. They were dismissed as 'another crop of Whistler's little jokes,' or as 'amusing.'" It was not exactly Venice as the tourist knew it, or the Venice of Guardi and Canaletto, or "of a maiden's fancies" as one critic said. Whistler had left the "Stones of Venice," as of London, alone. The little back canals, the lagoons, the doorways, archways, balconies and bridges appealed more to him than St. Mark's or Santa Maria or the Doge's Palace. He sought, in fact, a "Venice in Venice," thinking it an impertinence to reproduce the masterpieces of the Old Masters. Not an easy search, and still less easy now, as Muirhead Bone found when he went to Venice a few years ago, and seemed to find "Whistler" written all over it. Nobody seemed to take these Venetian etchings very seriously, and as to sales, even America ordered no more than eight sets. We must remember, however, that the only etchings by Whistler that were at all well known at that time were the Thames etchings and the French etchings, and these were certainly very different, though it should have been possible to see some continuity, some evolution at work in the Venice etchings if scrutinised carefully. Wedmore says that the Venetian plates were not shown in finished form, that they were "unready and

unripe," and that it is not surprising they were coolly received, therefore. One cannot help feeling that Whistler's stock was standing below par at the time, and that therefore nobody was bothering much about him. But it is time we looked at the etchings themselves and formed our own opinions on these disputes.



The "Little" Venice.

The series opens with the *Little Venice* (K.183). Here at once, surely, we have a masterpiece—"a thrice-refined and tranquil dream" in Wedmore's words—so admirable that we do not wonder that it has formed a whole school of etchers. There is not such a great deal of tone printing in it. The lines themselves carry the main weight of the appeal, as they do in Rembrandt's etching of "Amsterdam."

Then we have the *Nocturne* (K.184), a "close-up," as it were, of some of the buildings seen in the *Little Venice*. Here, certainly, the most effective impressions are again those printed with warm dark tones of ink carefully suffused over the plate, transforming the effect into something Turneresque, even Rembrandtesque. Was it this plate, perhaps, that one critic described as "This archimago of the iconographic aoraton, or graphiology of the Hidden," thus further mystifying the public as to the meaning of the print's apparent indefiniteness and mystery, though calling no attention whatever to its inherent beauty?

The Little Mast (K.185), and *The Little Lagoon* (K.186), follow, and then we come to the *Palaces* (K.187), one of Whistler's best known plates,

confuting another critic who stated that Whistler had never attempted to transfer to copper any of the more ambitious works of the architect. The traceried windows of the Venetian palaces fascinated Whistler, and he gives us glimpse after glimpse of them, adapting his style to suit their grace and elegance, as in his plate *The Doorway* (K.188) for instance, where again he supports the etched lines with cleverly managed tones of ink. It is a plate he altered considerably in its various stages, especially around the figures on the steps.

The Piazzetta (K.189), shows us St. Mark's Square with figures grouped around the steps of St. Mark's Column and the inevitable pigeons circling around, all touched in very lightly, yet forming a complete picture of the busy scene. Of *The Traghetto* there are two plates (K.190 and 191). The first was abandoned after a time in favour of the second which finally came to publishing point, although it gave the artist a considerable amount of trouble to compose and finish, we are told, just as its predecessor had done. Of *The Riva* also there were two plates (K.192 and 206), but these were both published—the first here in the set of twelve, and the second later in Messrs. Dowdeswell's set. The similarity between Whistler's etchings of *The Riva* and some of Frank Duveneck's etchings of Venice has often been commented upon. Duveneck was an American artist from Cincinnati whom Whistler found etching in Venice when he arrived there, and it has often been thought that it was from Duveneck Whistler obtained his ideas for his own Venice plates, especially those like the *Riva*. It is a question that is unlikely to be settled now. Pennell, in his encyclopædic and standard life of Whistler, passes lightly over the matter and is non-committal, and death is rapidly removing any remaining sources of information on the point. Even if they do somewhat resemble Duveneck's prints, Whistler's surpass them entirely, and there is always the possibility that the influence was the other way round.

The Two Doorways (K.193) on the bend of a canal provides interesting contrasts of light and shade, but we miss those passages of tracery and the ornamentation associated with the Venetian façades; still, Whistler thought the scene worth etching, and found beauty in it. That a dark doorway or archway always appealed to him is evident again from his well-known plate of *Beggars* (K.194), in which we note once more a De Hoogh-like effect. In one early state a young woman occupied the place of the elderly woman standing by the child in the later states, and to many these latter are unacceptable. In other respects, however, the changes effected in the later states are improvements, but in any state it is a plate that must be seen in a harmonious impression if it is to be properly judged. Some impressions of it were printed by Goulding for the Fine Art Society after Whistler's death, but they bear, for once, but hasty comparison with the fine proofs Whistler pulled. It was untrue to write of Whistler's art, as one critic did, that it was "happier in the gloom of a doorway than in the glow of the sunshine, and turns with a pleasant blindness from whatsoever in Nature or Man is of perfect beauty, or noble thought." Plates like *The Mast* (K.195) and its predecessors *The Little Mast* and *The Piazzetta* refute this. Hamerton

said of *The Mast* and *The Little Mast* that they are dependent for much of their interest on the drawing of the festoons of cord hanging from unequal heights. To this criticism Whistler wittily replied that the cords were at the service of critics of unequal sizes ! Whistler's relations with the critics were never happy, and he lost no opportunity of penning stinging retorts to their frequently puerile comments. Many of his critics' comments he published in pamphlet form, as well as in his famous book, "The Gentle Art of Making Enemies." It must be admitted he had great provocation. Much of the criticism was feeble in the extreme, and, strange as it may seem, he was seldom, if ever, given credit for any trouble, thought, point of view or motive in his work ; it was more often regarded as an evasion or a forsaking of the great canons of art. One wonders sometimes if some art criticism has much improved since.

The second "Venice" set, consisting in reality of twenty-one Venice subjects and five English subjects, was published by Messrs. Dowdeswell in 1886. There were thirty sets in all, at fifty guineas a set, and twelve extra impressions of fifteen of the subjects for sale separately. The plates were subsequently cancelled, and are now in America. This second set includes several more of Whistler's most famous etchings. We may pass over the *Doorway and Vine* (K.196), and come quickly to the *San Biagio* (K.197), deservedly a favourite, a picturesque rendering of a more or less slum quarter. *Beadstringers* (K.198), *Fruitstall* (K.200), and *Turkeys* (K.199), three smallish, upright plates give further glimpses of homely scenes in Venetian backwaters, and then we have the *San Giorgio* (K.201), one of the happiest of all, the planes in it most cleverly managed. In the *Nocturne : Palaces* (K.202), so much of the effect depends on the inking that the collector is forced to select his impression most carefully, that is, if he can afford to acquire it at all, for it is a four-figure print now, having acquired a great reputation and come to be considered one of Whistler's finest prints. The British Museum fortunately possesses a fine impression of this great plate.

The Long Lagoon (K.203), possesses much, but not quite all, of the charm of the *Little Venice*, whilst in *The Bridge* (K.204), we get a delightful peep into a remote and little-visited quarter of Venice.

In the first state of the *Upright Venice* (K.205) only the scene at the top was completed, the work on the lower part of the plate being added later. To many it has always been somewhat unsatisfactory owing to the division of the spectator's interest between two subjects, as it were. *Riva : No. 2* (K.206) is a repetition of the scene of the first etching of this name. Both plates have their champions, for both are very attractive.

The etching of *The Balcony* (K.207) is, from the point of view of both technique and picturesqueness, one of the best, exquisite in its detail—"a rendering well-nigh of beauty alone," Wedmore calls it. Whistler was constantly at work altering the shapes of the figure in the doorway and the figures at the windows. The eleven states of this etching make an interesting study and show how meticulously fastidious Whistler was in the placing of the prominent notes in his

prints; even the position of his "butterfly" signature was always most carefully planned. The etchings of a *Fishing-boat* (K.208), *Lobster Pots* (K.235), and the *Ponte del Piovan* (K.209), need not detain us, and *The Garden* (K.210), and *The Rialto* (K.211), need no special comment, though these last are important plates in the series. *The Long Venice* (K.212), so-called on account of its shape, to distinguish it from other similar views in the two series, is again a "close-up" of the buildings skirting the bay from the Doges' Palace away past the distant domes of the Salute. Whistler had trouble with the proportions of the distant domes and redrew them two or three times.

One of the most successful of the darker plates is the *Nocturne : Furnace* (K.213), in some states at least. Through a doorway a smith is seen at work in his forge, the strongly lighted interior forming a vivid contrast to the darkness without. *The Quiet Canal* (K.214) is a view down a narrow canal flanked by tall houses with gondolas moored before them, and has some rich patterned effects in it. *La Salute : Dawn* (K.215) is a close view again, but on a smaller scale, of some of the distant buildings seen in the *Little Venice*. In none of its four states, however, does it approach the beauty of the *Little Venice*; neither does the *Lagoon : Noon* (K.216), in which the brig with sails spread looms perhaps a trifle too large in the composition.

The remaining plates in the series published by Messrs. Dowdeswell are little views in London:—*The Wheelwright* (K.233), interior of a busy workshop; the *Temple* (K.234), a corner of an old street, economical in line and well composed; *Little Court* (K.236), *Drury Lane* (K.237), and *Alderney Street* (K.238), completing the series. All these little London plates, homely but dainty, come in well enough with the Venetian plates, but it is the Venetian subjects that give the set the prestige it has enjoyed almost from the first.

The remaining Venetian etchings were never published together but were sold separately, if at all, and are consequently much rarer. It is strange that some of them—*The Fish Shop, Venice* (K.218) and *The Dyer* (K.219) for instance—should not have been included in the published set in preference to the London plates, but there was doubtless some good reason for this omission; possibly it was because of considerations of the difficulty of disposing of the sets if the price were brought up too high. In *The Dyer* (K.219) there were certainly the makings of a fine plate, in spite of the difficulty Whistler evidently again experienced with the form and pose of the main figure. Some of these unpublished Venice plates were drypoints—the *Little Salute* (K.220) for instance, and the *Wool Carders* (K.221)—and it is interesting to compare them with the etched plates. Other drypoints were *Islands* (K.222), a very unfinished affair, but not without a certain vague charm; and *Nocturne : Shipping* (K.223), a repetition of the *Nocturne* in some respects, but on a smaller plate and far less successful. In none of the plates with nocturne effects does the printing stand for more than it does in this. Others we must pass, staying only to look at one, the *Nocturne : Salute* (K.226)—which we are inclined to think would have

been a very popular plate had it been completed and issued in a good state, well printed as Whistler could and would have printed it had he felt drawn to proceed with it—and to mention three others : *Gondola under a Bridge* (K.227), which might have rivalled the *Quiet Canal* or the *Bridge* in popularity, given a little more work here and there ; *Steamboat, Venice* (K.228), quite as interesting in many ways, even as Whistler has left it, as the *Upright Venice*, for instance ; and *Venice* (K.231), one of the largest of the views, most unaccountably destroyed after only five or six prints had been taken from it.

We have now arrived at the eighties. For the remaining twenty years of his life Whistler etched only intermittently, much of his time being taken up either with lithography, in which he had become interested, or with painting. For a time the copper-plate was used by him as a kind of note-book, and the etchings he made during the years immediately succeeding the publication of the second Venice set are mostly small in size and light in texture.

Many of these little plates are views in London, jottings of street scenes with groups of figures or hansom cabs. Here and there at first we meet a larger plate, such as *The Smithy* (K.240) (though this may have been done earlier, when the *Wheelwright* was done, for inclusion in the set). It probably inspired at least two of Sir D. Y. Cameron's etchings similarly entitled.

There is one small plate *Swan and Iris* (K.241), etched from a painting by Cecil Lawson, which Whistler made as a frontispiece to Sir Edmund Gosse's "Memoir of Cecil Lawson" published in 1883. In that year also a second exhibition of Whistler's Venetian etchings was held at the Fine Art Society's rooms, fifty-one prints being shown, Whistler himself preparing the catalogue and printing mockingly, after each number, quotations from various critics' judgments on his work. There are two or three little etchings of Dordrecht dating from about 1885 when he was in Holland with W. M. Chase ; there is one of Dieppe (K.246), and there are two or three little sketches in Paris. Then follows a long series of tiny plates, thumb-nail sketches many of them, having for subjects children at play, women sewing, village sweet-shop windows, old clothes shops, fruit-stalls and the like, some of the best being the *Fish Shop, Busy Chelsea* (K.264), *Rochester Row* (K.269), *York Street, Westminster* (K.270), *The Barber's Shop* (K.271), *Justice Walk, Chelsea* (K.275), and *Fleur de Lys Passage* (K.289). It was the period of Buffalo Bill's Wild West Show at Earl's Court and he made three etchings of that. Wedmore's words in this connection are worth recalling : " More to Whistler than to any one else who has worked with brush and needle do we owe that complete acceptance of modern life, of the modern world, of all that is miscalled its ugliness, of its aspects of every day, which complete acceptance, remember, whether in pictorial art or the art that is literature, is the most salient characteristic of the best workers of our time. Whistler, with a nature essentially aristocratic, knowing well, in the depths of his being, that art of any kind and 'the man in the street' have nothing in common, that what is called 'the plain man' and art are for ever divided, yet

accepted the very things which seem most commonplace to commonplace people, and showed us their interest. So great an artist—the fantastic beauty of Venice and the scaffolding of the Savoy, appealed to him together. The dome of the Pantheon, the Renaissance towers of Loches, a Cubitt-built house in Pimlico, the Candle-works over the river—they were all his material.”

1887 was Queen Victoria's Jubilee Year, with the review of the fleet at Spithead, to which Whistler went, bringing back twelve or thirteen delightful plates, all made in one day, as a record of his visit. Yet though made in one day there is in them, as Whistler maintained there was in the painting which had drawn Ruskin's ire, “the knowledge of a lifetime.” Of these plates *Monitors* (K.318), and the *Turret Ship* (K.321) possess distinct beauty and show that he had lost none of the art he displayed in his best Venetian work. Whistler presented to Queen Victoria a beautifully bound set of these “Jubilee” etchings on behalf of the British Artists' Society of which he was president, and this gift was the direct means of securing for the society the Royal Patronage and Charter. The set was eventually sold from the Royal Library, however, and went to America.

There were figure subjects, also, and more portraits—the Phil May-ish portrait of *Nora Quinn* for instance (K.333)—and studies of the model—*Nude figure reclining* (K.343), one of the best of them—for it was the period of his pastels of this type now so highly esteemed. Two plates entitled *Cameos*, studies of a young model with a baby, are specially delightful (K.347 and 348).

In the autumn of 1887 he went to Belgium with his brother and sister-in-law, Dr. and Mrs. William Whistler, and there are records of his visit in little plates of scenes in Ostend, Bruges and especially Brussels, similar to those he had been making in London. On his honeymoon tour after his marriage to Mrs. Godwin in 1888 he went through Touraine, etching en route such little incidents and places as interested him. These etchings vary from tiny notes to plates of some importance, such as the *Chancellerie, Loches* (K.383), one of his own favourites, and *From Agnes Sorel's Walk* (K.385). They resemble one another and the London subjects closely, and are all etched more or less on one formula, so that their interest lies often more in the subject than in any novelty of treatment. It is noticeable, however, that in them all there is a renewed dependence on pure printing of the etched line itself, in place of the tonal effects of the Venice plates:

In the following year, 1889, Whistler's needle attempts and produces something more important, and we have a return to his great manner in the series of seventeen plates etched by him in and around Amsterdam. After he brought them back he was interviewed about them by the *Pall Mall Gazette* (March 4th, 1890). Pennell reprints this interview in which Whistler is reported to have said: “First you see me at work on the Thames . . . there you see the crude and hard detail of the beginner. So far, so good. There, you see, all is sacrificed to exactitude of outline. Presently, and almost unconsciously, I begin to criticise myself and to feel the craving of the artist for form and colour. The result was the second stage, which my enemies call inchoate and I call Impressionism. The third stage I

have shown you. In it I have endeavoured to combine stages one and two. You have the elaboration of the first stage, and the quality of the second."

These Dutch plates are mostly views of tenements beside canals, with cobbled pavements before them, or of backs of old crumbling brick houses reflected in the sluggish waters, and with balconies with figures leaning over them and clothes hanging out to dry from them ; or of the same houses at night, with their many window panes illuminated and casting long reflections in the water, all reminiscent of the façades of the Venetian palaces, but with such beauty as even squalor is seen by the artist's eye to possess, substituted for the beauties of the Gothic traceries of Venice. Of the best are *Long House—Dyer's, Amsterdam* (K.406), *Nocturne : Dance House* (K.408), and *The Embroidered Curtain* (K.410), whilst *The Bridge, Amsterdam* (.409), reminds us of his etchings of Putney and Battersea Bridges, and, though less than they, of his love for Japanese prints. There is one of an *interior of a mill* (K.413), with a view of distant windmills through the open doorway ; and finally the superb landscape etching *Zaandam* (K.416), in which he rivals Rembrandt's *View of Amsterdam*—Pennell maintains Whistler surpasses it—in freshness, spontaneity and quality of line.

Eight of the best of these Dutch etchings were exhibited at Mr. Dunthorne's gallery in April, 1890, when a few were purchased for the Victoria and Albert Museum and for the Royal Library at Windsor.

Whistler's career as an etcher was now nearly over, but there were still to come a few etchings of Paris, sketches again of shops and stalls and street-folk, and of children and nursemaids in the Luxembourg Gardens, similar to those he had been making, as we have seen, in London and elsewhere during the last few years. His etched work terminates with a little plate of *Corsican Bohemians* (K.442), done in the winter of 1900-1901.

Whistler died at 74 Cheyne Walk on July 17th, 1903, and was buried in Chiswick Parish Churchyard, not far from the tomb of the great Hogarth for whose work he had always evinced the profoundest respect and affection. An extensive memorial exhibition of his paintings, drawings and etchings was held in London in the Spring of 1905, under the auspices of the now defunct International Society of Sculptors, Painters and Gravers of which he had been President. That is twenty-five years ago, but his reputation as an etcher has but been enhanced since, and the influence of his etchings on those of his successors is too well known to need comment. In this respect he may be bracketed with Rembrandt and Meryon as veritable masters of the universal guild of etchers, for few etchers to-day would refuse to acknowledge their indebtedness to him for many hints, even where they do not frankly imitate him. Doubtless injudicious and excessive praise has been bestowed on him by some, but it is an error that may be excused, for in James McNeill Whistler the world was undoubtedly given one of the greatest exponents of the art of etching, a master-etcher if ever there were one beside Rembrandt. Many of his prints deserve, as we see, and as Whistler himself hoped they would, to hang beside the Rembrandts.

Although, with few exceptions, Whistler's etchings were produced here, it is unlikely that there can ever be brought together again in London a comprehensive collection of them, so scattered have they now become. America was early in the field collecting them, and many, indeed the majority, have now reached her shores and found permanent resting-places there. To see Whistler's prints in anything approaching entirety it would be necessary to journey to Washington and view the late Mr. Charles L. Freer's collection which was bequeathed to the American nation and is now housed there ; or to the New York Public Library, which has also a good collection, the basis of which was the bequest of Mr. S. P. Avery. But there are still a few small private collections in Great Britain, particularly in Scotland, and there are quite good collections to be seen both in the British Museum (which has about a hundred and fifty, including states, and recently received a dozen more by bequest from Mr. Arthur Studd), in the Victoria and Albert Museum (which has sixty-three), in the Fitzwilliam Museum, Cambridge, in the Bibliothèque Nationale in Paris, and in Dresden, whilst there are a few in Melbourne, Venice, and other centres. For the student there are several catalogues for reference— that by Sir Frederick Wedmore, first published in 1886, revised and re-issued in a second edition in 1899 and followed by a supplementary volume issued by Mr. E. G. Kennedy of New York in 1902 ; Mr. Howard Mansfield's catalogue, published by the Caxton Club of Chicago in 1909, and finally the monumental catalogue by Mr. E. G. Kennedy, published by the Grolier Club of New York in 1910, comprising one volume of text describing all the known states of the etchings, and portfolios of reproductions of all the states themselves.

For all biographical matters—and the life of Whistler is a fascinatingly absorbing one—there is Mr. and Mrs. Joseph Pennell's " Life of Whistler," now obtainable in one volume.

In taking leave of Whistler's etchings we may think of him, as of Rembrandt, as a revealer, a discoverer of beauties where none were thought to lurk. He has opened our eyes and shown us how near lie memorable glories, some evanescent others permanent. He has reclaimed for us, from one corner after another, things of magical significance. To him we may accord the honours given, though often late, to all pioneers, and safely leave his great work to the final judgment of posterity along with that of Meryon and Rembrandt. In the meantime, we may continue to allow our affections to be held by the masterpieces of these three great master-etchers, even as they were enthralled by this magic medium.

EXHIBITIONS

EXHIBITION OF POOLE POTTERY. Gieves Gallery, Bond Street. Till September 20th.

It is now possible to see representative shows of Poole Pottery twice a year, namely at some London gallery in September, and at the British Industries Fair in February. The wares of Messrs. Carter, Stabler and Adams can be seen elsewhere at other times, but it is worth getting an impression of the whole range of their enterprise.

Poole Pottery is downright and serviceable. Earlier models of the domestic ware of the firm remain congenial. The unglazed jugs and basins (glazed inside, of course) with their simple patterns resemble the peasant pottery of central Europe, and appear very well adapted to the needs of rural households. The newer models are intended to look more modern, and many of them are agreeable and up-to-date without being exaggerated. There is sure to be a demand for the compact cruet stands and outwardly square egg cups that have just been introduced; though their efficiency is not going to enable them to oust traditional shapes.

Book-ends come somewhere between the utilitarian and the decorative, on the whole nearer the utilitarian. Poole Potters have given us several designs in this department, one of which makes us almost ready to reverse this common sense judgment. Their book-end with flowers is charming; the elephants and monkeys and knight on a charger (with or without *craquelure*) are perhaps too fanciful. The bowls and vases shown are decorated with a variety of patterns. The best are those in the least bright colours.

CORRESPONDENCE

ST. GEORGE AND THE DRAGON, WEST WYCOMBE

The illustrations of the George and Dragon signs in the *Journal* (Sept. 5) very much take my fancy. I think early nineteenth century, or late eighteenth century, may be a better date for their production, which seems to me to owe much to inspiration to Pistrucci's design. The group on page 1056 is clearly by the better draughtsman—and composes better into the oval than the elaborated grotesque rendering on p. 1057. Here St. George, rather tucked up, is spearing a *tooth* and looking between the ears of his steed. St. George on 1056 is a far abler man, and looks at his spear running well through the dragon. The prancing of his horse is more natural and forcible than the uncertain semi-stolid steeds of 1057.

I wish I could go to West Wycombe to see the inn and its sign. I am very glad that the Society is doing such good work in preservation.

ALAN S. COLE.

THE RADCLIFFE OBSERVATORY

I have recently returned from a visit to South Africa, and have read with much interest the article on this Observatory in your *Journal* for May 23, of which you were kind enough to send me a copy. There is one misstatement of fact in the article to which I should be grateful if you would call the author's attention.

Referring to the two figures supporting the globe at the top of the tower, described as "Atlases," it stated that "he has made them beardless." This is not the case. Only one of the figures is beardless. In fact it is a tradition of the Observatory—I have been able to find no documentary confirmation—that the two figures are those of Atlas and Hercules, and illustrate the story how Hercules for a short time took over Atlas' task. The figures are those of an old man and a younger man, and this explanation of their duplicity seems to me a very plausible one.

H. KNOX-SHAW,
Radcliffe Observer.

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No. 4062

FRIDAY, SEPTEMBER 26th, 1930

VOL. LXXVIII

All Communications for the Society should be addressed to the Secretary, John Street, Adelphi, W.C.2.

NOTES OF THE WEEK

"The produce of the husbandman's labours is the only merchandise which all the world is obliged to deal in, and it was such a consideration that induced many early writers to recommend agriculture as the most profitable of all the arts.

"War, navigation and commerce can never dispeople a wise nation whose agriculture flourishes in full vigour, as industrious nations are the most populous as well as the most virtuous. Industry is the 'vis matrix' of husbandry."

Canon Harte, "Essays on Husbandry."

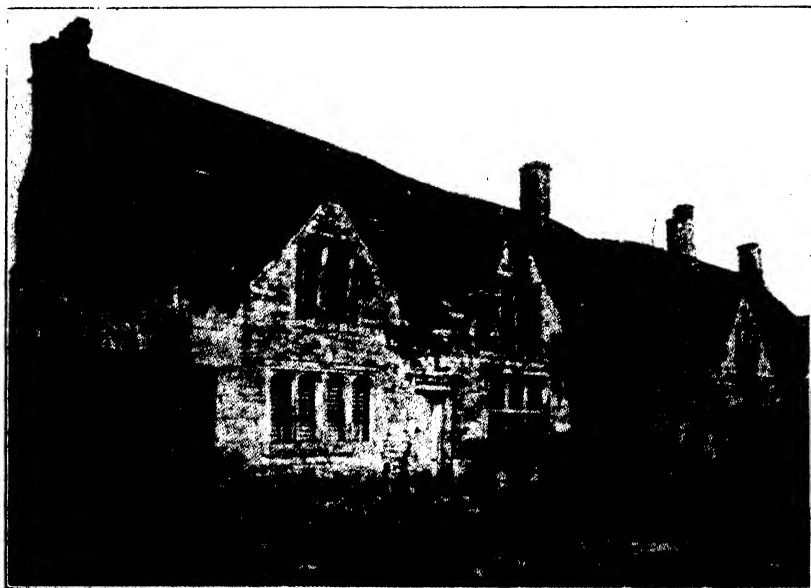
Agriculture.—We recall that Arthur Young was a member of this Society from 1769 till his death in 1820, and in 1774 he became Chairman of the Committee on Agriculture. In his well-known "Farmer's Letters" he speaks in high praise of the Society's work in connection with agriculture and of the prizes offered for the encouragement of research work. There seems to be a widespread feeling that if we are to get back to any real prosperity in this country we must consider seriously a return to the land on a new and more scientific basis. It may be that the solution of the Unemployment problem will eventually come in this way.

"Let farmers propose a scheme," says Mr. Lloyd George, "and no party in the State could resist a reasonably concerted, well-thought-out plan which represented the whole of the agricultural community and its interests.

"If the State used its credit for agriculture, I believe it would give it a new start, but agriculture is so run down by generations of neglect that no single remedy would restore it. We must have several. If there was to be any preference at all, it should be given not to the foreign producer but to the home producer. We wanted long credits for permanent improvements and short credits for other improvements. We wanted credit, if necessary, for re-equipment and more propaganda.

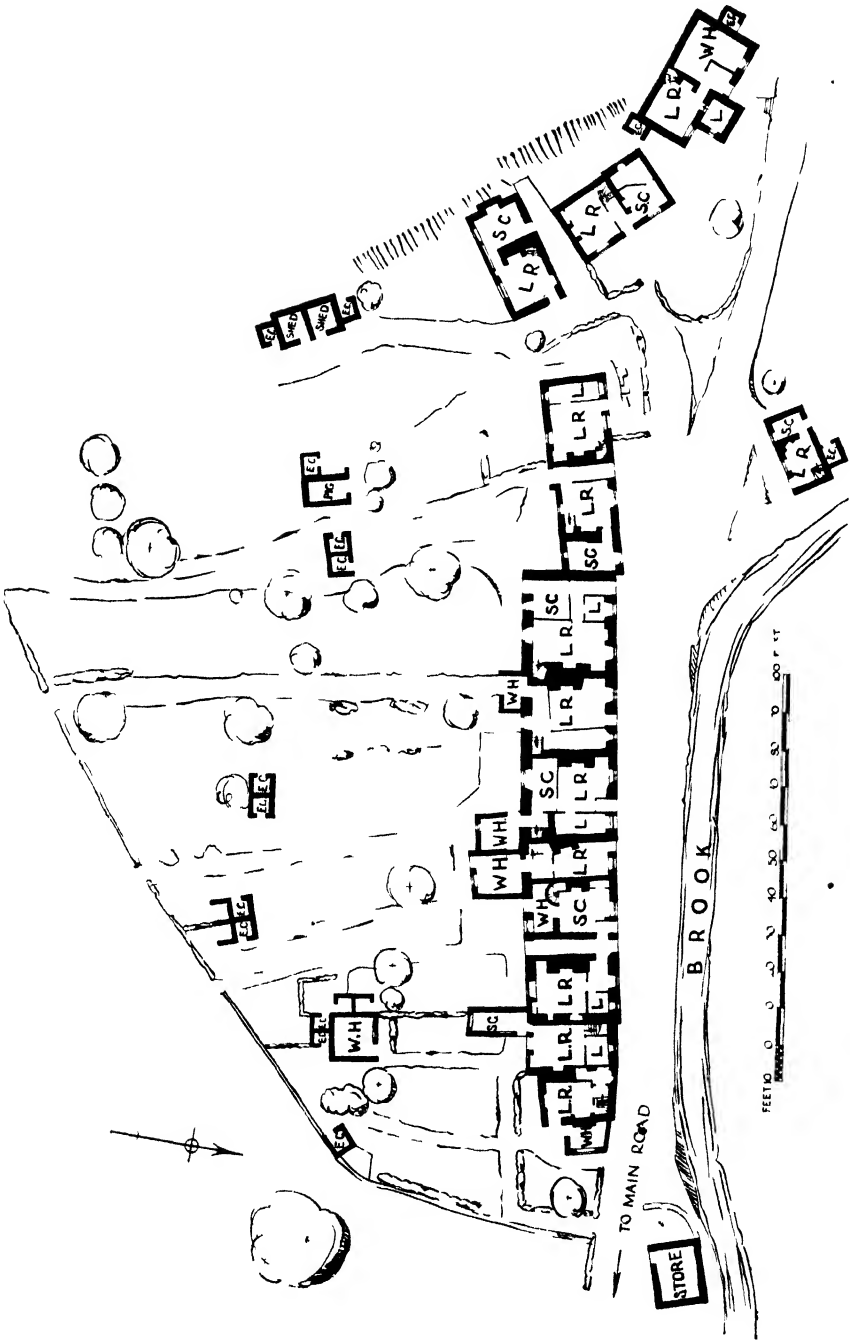
"The Empire Marketing Board could do a good deal more by calling attention to the superior quality of British milk, of British cheese, British barley—in its solid form and even in its liquid form—British fruit, and British vegetables. A vast amount could be done to increase the quantity which we could dispose of. All the advertising at the present moment was done by the foreigner and not done by the British farming community."

Arlington Row, Bibury.—The formal handing over of these cottages by the Royal Society of Arts to the Bristol and Gloucestershire Archæological Society took place on Thursday last. A full report of the ceremony is given below (pages 1139-42). The plan, which we publish this week, will, we think, be of interest. The rather wasteful irresponsibility of the planning is accounted for by the fact that the cottages were originally formed out of malt house buildings; hence the



Derelict Cottages at Nunney, Somerset.

very large expanse of roof, and the excessive thickness of the internal walls. Nevertheless, however uneconomic the planning of these cottages may be, their beauty of material and their setting in the landscape made their preservation of the greatest importance to the Cotswolds. They form a considerable landmark close to the river and the village of Bibury, which is generally considered the most beautiful of all the Cotswold villages—by many the most beautiful in England; it is certainly one of the most characteristic and unspoilt. There are many cottages in Bibury



Plan of Arlington Row, Bibury.

which are architecturally more beautiful in detail with their mullioned windows and moulded doorways, but the Arlington Row cottages seem to stand out as a distinctive group in the landscape outside the village. The Bristol and Gloucestershire Archæological Society have created a separate Trust to deal with these cottages. We suggest that the activities of this Trust might go much further, and that a census might be made of all the Cotswold villages, noting any examples that are in disrepair through neglect. They might draw the attention of the owners to the value of their possessions, and the folly of allowing such well-constructed buildings to get into such a state that their restoration becomes a matter of serious expense. We are reminded of another group of cottages in the sister county of Somerset beneath the ruins of Nunney Castle, which the Society illustrated in its original booklet on Old Cottages. The Office of Works have the Castle under their charge. It would appear as if these cottages had gone almost beyond repair, but we could not help thinking, when passing them the other day, that if cottages were required in the village, the owner would not only be providing accommodation, but adding to the charm of his village by giving these a new lease of life. They are more architecturally interesting in their details than Arlington Row, and even now would pay the owner to reconstruct.

Porza.—The following account is taken from a pamphlet recently issued by the artistic community known as "Porza":—

"Porza is the name of a small village close to Lugano on Lake Lugano, Switzerland. Here the idea of the Porza Community was conceived under the influence of specially favourable climatic and economic conditions, which this country offers to the artists living there. Cultivated by a small circle of friends at first, the idea of 'Porza' was propagated, until in autumn, 1927, after continual development, the initial stages of the 'Organization Porza' were reached.

"First it planned to ensure better working conditions to a group of artist friends, whose work suffered owing to adverse conditions. Very soon, however, it seemed advisable to transfer the Porza Movement to a city, that is, to a centre of mental and cultural interests, where the restlessness of the metropolis forces people to concentrate and rest; and where the danger of losing contact with the outer world and of becoming narrow-minded and isolated appears to be best averted.

"The first offices temporarily established in December, 1927, in Berlin were under the management of the founder, Wc. v. Alvensleben Porza, which up to that time was merely an Artists' Association, and then developed into an all-embracing community for productive mental workers of all kinds and ranks. The Bureau started shortly after a methodical propaganda and succeeded in attracting a large circle of the public. At short intervals several Exhibitions followed on a considerably large scale, each time a larger number of renowned but unknown artists (*sic*) participating. At the same time a course of lectures on various subjects in art and science was arranged. The Community of Porza submitted its pro-

gramme to responsible official and semi-official quarters and met with understanding and ready support from all sides.

"Porza is a general congregation of all those who are scientific workers and artistic creators, regardless of what sphere of art and what branch of science they may have chosen. This community, which embraces seemingly incongruous professions, has one common and uniform interest which tends to establish an economic balance between mental production and material valuation. Porza therefore gathers the actual impulses and desires, the acts and effects from the realm of a living and creative mind and holds them together in a loose bond. It aims, within a broad organisation, at achieving a perfectly harmonious co-operation of cultural forces and of approved economic experience. Thus, Porza becomes a community movement ruled by a forceful idea and an unrestricted organisation."

National Trust Report.—We have received a copy of the National Trust Report, and read its growing record of its acquisitions with satisfaction. Surely, there is no Body which justifies its existence more completely, and merits the support of everyone who values the importance of preserving for all time the natural beauties and characteristic buildings of this country.

Synthetic Ware.—We visited the Beatl Showrooms in Regent Street, and were impressed with the possibilities of this material in so many branches of household equipment. The possession of pleasant-looking, and yet unbreakable tea and coffee services, made an instant appeal at so reasonable a cost.

Drama.

"**BRAIN.**" A play of the whole earth. By Lionel Britton.

"**PLAYS OUT OF TIME.**" By Harold F. Rubinstein.

Publishers : G. P. Putnam's & Sons.

"Brain" belongs to the type of play that is written either by a very young man or by Mr. Bernard Shaw.

Mr. Lionel Britton is presumably a very young man with a big idea and a gift for writing vigorous dialogue, but he has not yet learnt to resist the temptation to tilt at bishops and prime ministers. His play is undramatic in form and so technically unwieldy that he has been forced, as his stage directions show, to create not only a play, but a theatre capable of staging it and an audience capable of following his working out of the theme.

In publishing "Brain" Messrs. Putnam have done the public a greater service than did the Masses Guild in producing it, for the difficulties of providing it with an adequate production under present theatrical conditions resulted in a rather ludicrous chaos, whereas, unhampered by the concrete limitations of the proscenium arch this "play of the whole earth," of a Brain which is constructed in the Sahara

Desert out of pure mechanism, by the whole of the human race, is exhilarating and entertaining to read.

Mr. Harold Rubinstein is an old hand at the game. In "Plays out of Time" he plays with the theatre as with a piece of elastic, stretching it and shrinking it to his requirements.

These three plays are satirical dramas, delightful to read, and they must commend themselves as delightful to produce to enterprising theatre folk who are not terrorised by the proverbial commercial backer.

"Hippodrome Hill," a play of conscience, is a further story of Clement Burns, the hero of an earlier play by Mr. Rubinstein, "The House." "Britannia Calling" is a satire with a thrilling plot, placed in Roman Britain, but written from a modern point of view, and "Stephen Into Dickens, a Comedy of Three Pieces in Parenthesis," deals with an intricate dream of a man under gas in the dentist's chair, and has an amusing surprise ending.

Mr. Rubinstein uses the piano played on and off the stage, both in "Hippodrome Hill" and "Stephen Into Dickens" in a way that adds cleverly to the dramatic value of the plays.

"RICHARD III." By William Shakespcare. New Theatre.

Mr. Baliol Holloway is determined that Shakespeare's "Richard III" at the New Theatre shall not be outdone for thrills by Edgar Wallace's "On the Spot" at the theatre next door. For every drop of blood shed by Wallace, Shakespeare sheds six, and Mr. Holloway shows us nearly every one.

Lady Ann, in the first scene, throws back the pall from the bier to show the features of the dead Henry VI, instead of addressing the usual tactfully draped indiscriminate mound of property master's stuffing. We can almost discern the handsome features of the unfortunate Hastings (dashinglly played by Mr. John Laurie) in the blood-soaked napkin, and Buckingham, instead of being led discreetly into the wings for execution, kneels at the block in so slow a black-out that we could almost swear to seeing the axe severing his neck. In fact, until the last trickle of congealed liquid creeps down the neck of the stabbed Richard, we are spared no realistic detail.

Mr. Holloway's Richard is so humorous and human a villain that it is not so impossible as usual to understand how Lady Ann and Elizabeth could fall to his charms. Here is a fine performance, and although it threatens to become a shade too lovable at times, the unfailing "alacrity of spirit and cheer of mind" with which he endows the magnetic Richard, explains his genius for "getting away with it" far more clearly than the more conventionally villainous performances of many of his predecessors.

Apart from Richard and Hastings, the best performances are given by Mr. William J. Miller as the second murderer, and Masters Harold Reese and Roger Foster as the two truly princely princes. It is difficult to understand how some of the ladies could have found their way into court circles.

PROCEEDINGS OF THE SOCIETY

ARLINGTON ROW, BIBURY

A meeting was held in the garden of the Vicarage at Bibury on the afternoon of Thursday, September 18th, for the purpose of handing over the deeds of Arlington Row, Bibury, by the Royal Society of Arts to the Bristol and Gloucestershire Archæological Trust. MR. W. H. KNOWLES, F.S.A., President of the Bristol and Gloucestershire Archæological Society, was in the chair.

MR. W. H. KNOWLES remarked that during the last few years the rapid development of road traffic and increasing building activities had caused much thoughtless destruction of beautiful scenery and the erection of incongruous buildings with vulgar and unsympathetic materials.

Through the instrumentality of the Royal Society of Arts, the Council for the Preservation of Rural England, the Society for the Protection of Ancient Buildings, and the architects who had so nobly volunteered their assistance, much was being accomplished to indicate how new buildings could be effectively treated.

These things particularly affected Gloucestershire, which was so rich in charming villages, with delightful churches, manor houses and cottages, usually picturesquely grouped amid abundant foliage and surrounded by vale and wold of wondrous beauty.

Of the villages Bibury must be ranked among the most beautiful. When, therefore, two years ago, the portion of Bibury known as Arlington Row was in a dilapidated condition and in danger of becoming a total ruin, it was a most fortunate circumstance that the Royal Society of Arts came forward and shouldered the responsibility of its preservation. The Society acquired the property and had since restored the cottages with the assistance of Mr. P. Morley Horder, who with excellent taste and skill had managed to retain their old-world charm.

Thereafter it was necessary to vest the property with trustees willing to take over the care and upkeep of the cottages, a task which had been rendered possible for this and for other properties in the county by the creation of a trust comprising members of the Bristol and Gloucestershire Archæological Society.

MR. ALFRED POWELL, on behalf of the Royal Society of Arts, performed the function of handing over the deeds. As one, he said, who had something to do with the starting of the movement for the preservation of the ancient cottages of England, it afforded him much satisfaction to be present at this gathering and formally to place Arlington Row in the safe custody of the County Trust. Old cottages were an integral part of the beauty of England, and it was the aim and intention of the Royal Society of Arts to do a national work for their preservation. Of course such things could not be done without money, and, though the bulk had been subscribed, there still remained a certain sum to be raised to pay for the purchase and renovation of Arlington Row.

Some people thought that work of this nature was money thrown away, but

happily there were many others who took a different view, as certainly did the Americans who bought old buildings, etc., and had them rebuilt on the other side of the Atlantic for the sheer beauty of the old designs and craftsmanship. Cottages like Arlington Row had been the homes of many generations of country folk, and apart from the beauty of the architecture, they had associations and traditions which endeared them to the peasantry and which rightly called for their preservation from demolition or decay.

MR. POWELL then formally handed the deeds to MR. J. J. SIMPSON (Chairman of the Bristol and Gloucestershire Archæological Trust), who returned very cordial thanks for the gift, and expressed the hope that as time went on other interesting buildings in Gloucestershire would be similarly placed in the custody of the newly-formed Trust. The Royal Society of Arts had rendered a splendid service in this matter, not only to this county but to the whole country, since the preservation of so notable a beauty spot was a matter in which, in these days of easy locomotion, all of artistic and antiquarian tastes were concerned. The Cotswold district was visited by very large numbers, and its distinctive architecture justly admired. In no part of England, indeed, did the architecture of a district fit more harmoniously into the beauty of the natural scenery than did that of the Cotswolds.

MR. SIMPSON moved "that this gathering very cordially expresses its appreciation and gratitude to the Council of the Royal Society of Arts for their public-spirited and generous effort to preserve some of the beauty of England and its unique traditional buildings, and especially for saving Arlington Row and handing it on intact as a continuing joy for future generations."

The speaker added that the Trust had appointed a committee of management of gentlemen resident in the district to look after the cottages, this committee consisting of Col. Palmer, Col. Longfield, Mr. Tollemache Scott, Mr. Jewson, and Mr. Scotford Harmer.

LORD ASKWITH, K.C.B., K.C., D.C.L., thanked the proposer, seconder, and meeting for the graceful expression of appreciation conveyed in the resolution, and said it afforded him much pleasure to represent the President (H.R.H. the Duke of Connaught) and the Council of the Royal Society of Arts on this very interesting occasion. The Society was endeavouring to carry out a national work for the preservation of beautiful old cottages. It had several projects in hand, but its policy was not to attempt to do many things at once: it carried out one undertaking before embarking on another. As regards Arlington Row, the original estimate of the cost of purchase and renovation was £2,000. Fortunately, they had been able to achieve the object for £1,750, and he thought the work had been admirably carried out by the builders, Messrs. Orchard and Peer, under the direction of Mr. Morley Horder. Unfortunately there was still a deficit of £350, but he hoped that as a result of the meeting this might be greatly reduced.



Arlington Row, Bibury.

MR. G. K. MENZIES (Secretary, Royal Society of Arts) desired to endorse Lord Askwith's hope that the deficit might be wiped off, in order that the Society might be free to proceed with other preservative work. So far from Americans having had designs on Arlington Row, he stated that it was an American gentleman, Mr. James H. Hyde, who headed the subscription list with a contribution of £500, and he felt very strongly that after such a splendid lead it was up to us to do the rest.

The thanks of the meeting were then conveyed to the vicar (the Rev. W. H. Spurrier) for lending the use of his grounds, and to Mr. Tollemache Scott for providing tea.

CORRESPONDENCE

THE FUTURE OF THE EMPIRE

My letter published in the *Journal* of June 6th has produced such a volume of correspondence that it is quite impossible to reply individually, and I must crave permission to let this present serve as answer to the general query as to why the always-important question of University training is especially so at the present juncture.

In the first place, I must make it clear that I am not thinking particularly of the present economic crisis which we, with the rest of the world, are wading through, but rather in terms of centuries or at least decades. "Where there is no vision the people perish."

The British Empire owes its preponderating position in the first instance to the urge of the Nordic spirit, which we inherited from our Scandinavian, Anglo-Saxon and Norman forefathers. According to Biology, this same Nordic, or Aryan, or Indogermanic (as it is variously called) breed of men has been responsible for all the great world civilizations down through the ages: the Indian (with its Chinese offshoot), Mesopotamian, Egyptian, etc., and, finally, for the Græco-Roman, of which we are still carrying on the sacred fire under the name of our Western civilization. The history of past civilization is, in each case, characterised by a wonderful period of blazing glory, followed by a period of decline, and then a flickering out, due we are told, to the fact that the Nordic breed, for various reasons, became swamped—suffocated—by the less active breeds of men.

History has a habit of repeating itself, and there *was* a very real danger that this same fate awaited our own civilization. Thanks, however, to the enlightened biological work which has been carried out during the last few decades, to a certain extent in our own country, but more especially in Scandinavia, Germany and the U.S.A., there seems to be a sporting chance that we shall succeed in saving ourselves—providing only that the representatives of the Nordic race in these and other countries contrive to work together in brotherly emulation for the general good of the world, instead of actively killing each other off as they have been only too wont to do in the past. In other words, providing that the call of the race be stronger than the call of the nation. It is rather important to save the Nordic race, because if it goes under there is apparent no hidden source of new recurring spring emigrations to revive the sacred fire, as was the case in the past; and so the world would revert to a state of abysmal night. Judging from the vigour of the recent plantation of the breed in North America and the Antipodes, it is for the moment still going strong.

The Nordic breed of men has always shown a remarkable spirit of adventure, pushing out into the unknown, the overcoming of difficulties. It is a race of rulers : witness the Græco-Roman exploration and development of the Mediterranean basin and, later, our own, on a larger scale, world discoveries of the last few centuries. In fact, the British section of the Nordic race has been so happy in this connection that, after planting seedlings in every corner of the globe, there remain no more realms to conquer ; and perhaps Scott's gallant dash for the South Pole was symbolical in this respect. During this " geographical " period the British Empire has had a very prosperous time, especially as the English invention of the steam engine and the spinning mill came aptly to hand to enable us to profit fully by the new markets before the other nations got into stride.

But the 1,000-year-long " geographical " period of our island history has apparently come to an end, and we must never again expect, as some still idly do, to profit from these " geographical " advantages, particularly as our own offshoots, the U.S.A., Canada, Australia, New Zealand, etc., are themselves, in turn, and with ever-accelerating tempo, becoming dynamic centres, not to mention the ever-increasing manufacturing energies of our great Indian Empire, and also of China and Japan, but also largely due to Nordic inspiration. And so to this " geographical " period will now succeed what we may perhaps call the " technical " period, in which our energies must be bent, not to the discovery of new hemispheres, but to the more mental task of harnessing the forces of Nature to man's command—and how tremendously vaster are the unexplored realms of Invention than even the discovery of whole Continents ! No longer will the man at the wheel or on the bridge be the dominating factor, but rather the man at the drawing-board or in the laboratory. The question is whether the type of Britisher we have evolved for the solution of our Empire problem will be as successful in this new age. The answer is, that we shall be if we train for it. The essential element—the Nordic spirit—is still comparatively unimpaired.

Now let us observe Germany, who possesses about the same percentage of Nordic blood in her national make-up as we do, and therefore starts off in the race with the same essential initial advantage. Owing to the fact that before the war she had very few and since the war no colonies at all, it follows very naturally that the energy, which we British have exercised in the ruling and development of our vast overseas Dominions, Germany necessarily directed towards other channels, and notably towards technical achievements. In order to effect this, it was necessary for the German Universities to produce a continual generous flow of ever cleverer and more acutely trained brains, and to see to it that the *best brains* were given the *best means* of attaining the *best results*. And so she has so popularised her University system that every youth and girl with the necessary ability can find the way to the seats of learning. One sees locomotive drivers' sons, and the children of small shopkeepers, artisans, and peasants, taking their degrees as Engineers, or Doctors of Philosophy, etc., whilst working perhaps, between terms, as factory labourers or clerks—this is the spirit which is animating this country. And consequently, not by mere chance, a German airship was the first to circumnavigate the globe, a German ship holds the blue ribbon of the Atlantic, and the German patent position in the electrical and chemical industries not to mention others, is becoming ever stronger ; whilst we must also not forget the work of German scientists in the laboratories of the U.S.A. Further, the *élite* of the nation invariably speak at least two foreign languages, and can thus converse with overseas people in their home tongue.

And what is the position in England ? Due to the reasons previously indicated, the University, in spite of progress and development in recent years, is still largely

a class reserve; in any case, it can be safely said that the great middle class, as a whole, is in no way convinced of the necessity of University training; it still contents itself with a good secondary or public-school education, and thinks that an ounce of practice is worth a ton of theory. It is always dangerous to generalise, and one must not ignore the past brilliant work of British scientists and engineers, but the weight of observation goes to prove that at the moment Germany has stolen a march on us in more quickly grasping the requirements of the new era, in the same way, incidentally, as did the Portuguese and Dutch in the "geographical" age.

And if comparison with other nations points to the necessity of more concentrated attention to University training, so does a glance at the interior structure of our Empire point to the same conclusion. *We must look ahead.* In one hundred years from now Canada will number approximately 100 million inhabitants, Australia probably 50 million, and New Zealand 25—all white men—I only mention the larger Dominions), whilst England, owing to the more economical distribution of our population throughout the Empire, will most probably have sunk from 45 to about 30 million—a figure more in keeping with our superficial extent. In any case, it is certain that the white population centre of gravity of the British Empire will have moved from London to some point out in the Pacific Ocean. But still London and England may be the political and cultural centre of the Empire, *if*, by that time, our chief exports be not merely Coal and Cotton (which, owing to Dominion manufacturing developments, will have necessarily declined), *but acutely trained brains*; *if* the Old Country (owing to improved air communication, Australia will presumably be scarcely a week distant, and Canada only just over the way) be the recognised centre of learning where the sons of the whole wide-flung Empire congregate together at the feet of their common Mother, exchange ideas and ideals and then go forth again fully equipped to carry on their life's mission. So was Athens for many centuries the recognised seat of learning of the then known world, long after her mere geographical importance had waned.

And so my suggestion amounts to this: that it behoves our Society—perhaps more than others, owing to its constitution and aims—to inaugurate a well-planned and consistently-persued crusade with the object of educating the public to the growing and imperative necessity of University training for the élite of Britain's youth, if England is to maintain her position in the world. A new era is opening up before us, and we must equip ourselves in consequence. *Labor omnia vincit.*

S. J. EGERTON BANKS, *M.I.Mech.E.*

MEETINGS OF OTHER SOCIETIES DURING THE ENSUING WEEK

MONDAY, SEPTEMBER 29. Analysts, Society of Public, at Burlington House, W. 8 p.m. (1) Mr. G. W. Baker, "Scientific Evidence relating to Firearms, with Special Reference to a Recent Murder Trial." (2) Mr. J. W. Croxford, "The Composition of Rye Oil." (3) Mr. G. E. Lester Smith, "The Determination of Unsaponified Oil in Soap or Fatty Acids." Faraday Society, at the Laboratory of Physical Chemistry, Cambridge. Discussion on Colloid Science applied to Biology: (1) "Equilibrium in Protein Systems." (2) "The Structure of Living Matter." 2 p.m. to 4 p.m.; 4.30 p.m. to 7 p.m. (1) Professor A. V. Hill, F.R.S., "Membrane-phenomena in Living Matter—Equilibrium or Steady State." (2) Dr. R. A. Gortner, "The State of Water in Colloidal and Living Systems." (3) Professor E. J. Bigwood, "Distribution of Diffusible Ions in Gels." (4) Professor W. Pauli, "The Behaviour of Proteins towards other Colloids and towards Electrolytes." (5) Professor F. F. Nord, "The Biological Significance of the Physical Influence of Gases on Colloids."

TUESDAY, SEPTEMBER 30. Faraday Society, at the Laboratory of Physical Chemistry, Cambridge.

Discussion on Colloid Science applied to Biology, 10 a.m. to 1 p.m.; 2.30 p.m. to 7 p.m. (1) Dr. Honor B. Fell and Dr. Wilmer, "The Structure Behaviour and Physiological Characteristics of Vertebrate Cells cultivated *in Vitro*." Professor E. Faure-Fremiet, "The Kinetics of Living Matter." (3) Professor R. A. Peters, "Surface Structure in the Integration of Cell Activity." (4) Professor O. Warburg, "Surface Reactions in Living Cells." (5) Dr. Hans Pfeiffer, "Isoelectric Point of Cells and Tissues." (6) Dr. A. von Muralt and Dr. J. Edsall, "Double Refraction in Protein Systems." (7) Dr. J. H. Quastel, "The Mechanism of Bacterial Action."

WEDNESDAY, OCTOBER 1. Central Asian Society, at Burlington House, W. 5 p.m. Mr. M. Vyvyan, "The Caravan Road from Persia to Turkey."

THURSDAY, OCTOBER 2. Refrigeration, British Association of, at the Institution of Mechanical Engineers, Storey's Gate, S.W. 3.30 p.m. Sir William B. Hardy, F.R.S., Presidential Address. University of London, King's College, Strand, W.C. 5.30 p.m. Mr. Henry Wickham Stead, "The Suicide of Austria-Hungary, 1908-1914." Lecture I—"The Austro-Hungarian Diplomatic Documents."

FRIDAY, OCTOBER 3—Junior Institution of Engineers, 50 Victoria Street, S.W. 7.30 p.m. Mr. S. J. Crispie, "The Development of the Bridge."

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No. 4063

FRIDAY, OCTOBER 3rd, 1930

VOL. LXXVIII

All Communications for the Society should be addressed to the Secretary, John Street, Adelphi, W.C.2.

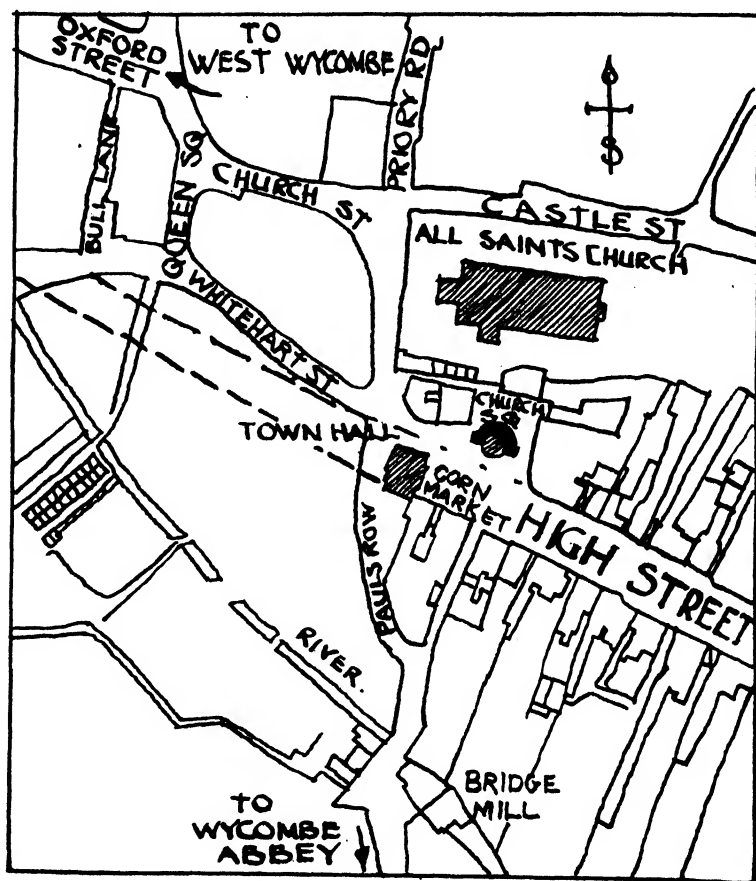
NOTES OF THE WEEK

"We think in words, and we talk of architecture and fine designs and art and style and so on, but we do not seem to notice with our eyes how little of these things we get in the real streets of the real towns we know—London and Leeds, Manchester and Macclesfield, Birmingham and Bristol. It is the real towns as they are that I want to get people to see, really to see with their eyes, not as statistics, or as history, or as town planning on paper, as theory or style, but with their eyes as they are: the approach, the railway station, the High Street, the food obtainable, the music, the general means of life and civilisation, the houses, the shops, the public buildings, even the lamp posts, and the ugly blotches of the advertisement disease. If we agree in thinking that we should at least aim at bettering all these things, I want to suggest that we need a bigger centre and substance to work from than the personal one; we need a sense of citizenship, of public order, of national spirit."

Professor R. W. Lethaby, "Architecture and Civilisation."

High Wycombe and West Wycombe.—In these days of business depression it was good news to read in a recent issue of *The Evening News* that "the old-world town in the heart of South Bucks (High Wycombe) is prosperous beyond a shadow of doubt." In an interesting little article the "special correspondent" goes on to describe the hopeless congestion of the narrow streets through High Wycombe and on to West Wycombe, where the Society has for some time been dealing with the problem of giving a new lease of life to an industrial village. We gather that the Council of High Wycombe have elaborate schemes for solving the traffic problem there. A proposal was put forward some time ago to improve the conditions in the centre of the town by a partial demolition of the churchyard, but we understood this scheme was abandoned on the obvious ground that the gain was insufficient to warrant the destruction of so characteristic a portion of the town.

A glance at the plan (which we publish) will show how hopelessly complicated is the problem of dealing in any adequate way with the continuously-growing traffic between the town of High Wycombe and the even narrower village street of West Wycombe to Oxford and beyond. This is the kind of problem which it is becoming increasingly necessary to face in connection with all our mediaeval towns, and must be giving the Minister of Transport considerable anxiety. On



the one hand there are the various societies naturally anxious to preserve characteristic buildings which really are an asset to this country, and on the other, the practical need of providing for modern requirements of transit. The opposition to the natural solution of the problem, viz., the bypassing of all these delightfully interesting but congested towns, comes from the business element, which seems to fear the loss of trade in consequence. In our opinion this is a very erroneous view, and a town less crowded by mere through traffic would be a more desirable place for shopping purposes. As an illustration, it is almost dangerous to shop in

a town like Guildford at a time when people mostly do their shopping, i.e., the afternoon. The adoption of the proposal to bypass this town would, we are sure, inevitably increase its business amenities. Looking again at the plan of High Wycombe, as shown, it is perfectly clear that the only logical way to deal with the traffic problem here is to go right through the Corn Market, the destruction of which we are sure would never be even considered, apart from the question of the cost of the property involved. Small roundings of corners and setting back of buildings here and there only involve ratepayers in great expense and but temporarily relieve the traffic, which goes on increasing in volume. A study of the plans of any old English town must convince anyone of the hopelessness of any attempt to deal with them on what we understand as town-planning lines. Their very irregularity, which constitutes their charm, defeats the town-planner at every point. It would seem that the inevitable bypassing of West Wycombe on to the High Road beyond might well be considered in relation to the more serious congestion in High Wycombe. We are convinced that the "prosperous and industrial town of High Wycombe" would gain immeasurably by this. Its prosperity might with advantage spread itself out to its near neighbour, West Wycombe, where chair-making is still the main industry.

St. John's College, Battersea.—In view of the continuous efforts of this Society to draw public attention to the importance of preserving this exceedingly interesting house, it is very gratifying to read the following announcement in *The Times* :—

"The Battersea Borough Council last night received a communication from the Ministry of Health stating that a provisional scheme for the preservation of the Principal's house, St. John's College, Battersea, had been placed before the Ministry, and asking that a deputation from the Council should attend at the Ministry for a further discussion of the position. The Council decided to send a deputation of five persons, headed by the Mayor, the Rev. A. G. Prichard."

We are sure the Battersea Council will be doing a public service in laying before the Ministry a suggestion for incorporating this building in their housing proposals, and that the Ministry will be only too willing to co-operate in so desirable a proposition. If the Council succeeds in preserving for Battersea a house so typically complete from within and without, it will set an example which must have far-reaching beneficial effects.

Electrification of Villages.—We are interested to note that the Bedford Corporation propose to provide electricity to villages by underground mains, the electrical engineer stating that it is possible to supply cheaper in this way than by the overhead wire system, which jeopardises the amenities of the countryside. If it is a fact, we trust that our electrical engineers will support the use of underground mains wherever possible.

Libraries for Hotels.—The *Evening Standard* calls attention to a real want :—

“ When Mr. Arnold Bennett discussed recently in these pages the absence of readable books in English hotels, I had hopes that hotel proprietors might pay some attention to the matter.

“ I am told that a well-known firm of booksellers actually prepared a scheme for supplying hotels with suitable libraries at very small cost. But not a single hotel took advantage of it.

“ In this matter we might well follow the example of the Americans, who have libraries installed in many of their best hotels.”

We have always thought that every large hotel could, with real advantage, have a quiet writing place, the walls of which might be pleasantly lined with books. Such a room would make an appeal to many more people than managers realise. The small country inns might also have such a place on a smaller scale with a few interesting journals and reference books, and maps of the district.

The Cotswolds.—We have been asked to suggest the best books on the subject of building in the manner of the district. There is no better book than Mr. E. Guy Dawber's “ Old Cottages, Farm-houses and other Stone Buildings of the Cotswold District ” (Batsford). There is no greater authority than Mr. Dawber on the subject and the book gives all the rules for producing the simple character of these delightful buildings. With the local materials and the simple rules here set forth few mistakes can be made by the intelligent builder. Unfortunately this book is, we understand, out of print and in any case is very expensive. We suggest to the Publishers that the time is ripe for a cheap edition, not only of this book, but of the excellent books in the same series on other districts.

Bungalophobia.—G. A. C., in the *Spectator*, writes as follows with considerable point and wisdom :—

“ My attention was drawn to the articles on Bungalophobia in the current issue of your paper, and I consequently ordered a copy (September 20th, 1930). It seems to me that it is at last dawning on the architectural profession that they are completely out of touch with the great bulk of the public.

“ Mr. C. Williams-Ellis states that ‘ not one in a thousand of the bungalows that one sees has been sponsored by an architect at all ’—this proves what I have just said of architects being out of touch with the public. A man buys a bit of land and then does precisely what he likes with it, regardless of anybody's feelings, opinion, advice, or prayers ; is he not a free Englishman, and therefore entitled to do what he likes with his own and do as much harm to his neighbourhood as possible, after having toured the country and scattered his litter everywhere ? The word ‘ architect ’ means chief builder, but he is seldom on the job. He has prepared his plans, specifications and bill of quantities and having done so, beyond a casual visit or two, he is only waiting to gather up his fees and do the same again to someone else. The contract duly signed—he's safe.

“ Now what I would suggest is this. A boy to become an architect should leave

school at 16 years, be apprenticed to a builder for three years, than be articled to an architect for three years, then earn his living in the building trade for two or three years, and then set up on his own to design and build houses for people who want them, as their clerk of works or general foreman, and in this way cut out architects' fees, builders' profits, clerk of works' fees, and foreman's wages. Then there will be no contract to break, and the client will not be at the mercy of the builder or architect. I was an architect, but I became a building architect, and was on the job all the time."

The matter is of such enormous importance that it would be interesting to have the views of the architectural Fellows thereon, and to pursue the subject, which so closely touches the preservation of the countryside.

Charing Cross and Waterloo.—There is a very interesting article in the *New Statesman* dealing with this great problem. The article concludes as follows :—

" Apart, however, from the question of a new station on the southern embankment, the L.C.C. valuers, it would appear, have convinced themselves that there are no great improvement values to be obtained on the Surrey side, and they argue that experience from the improvements of recent years is conclusive on this point. Assuredly it is not. There has been no work in that area that affords ground for an estimate of prospective values. Let the area be brought into Central London, and then we shall see. In any case, the whole tract cries out for demolition and reconstruction. Glance over it from any point of vantage : from the Hungerford Bridge or from a window of the vanishing Hotel Cecil. You will see an abomination of desolation, with a ramshackle river-front such as no capital in Europe save our own would tolerate. And at the same time you will be prepared to affirm that in no city of the world has the architect-planner been furnished with a more stimulating challenge or a more splendid opportunity."

Soviet Art and a Collection of Viennese Charcoal Drawings.—**Bloomsbury Gallery, 34 Bloomsbury Street, W.C.**—There is no better way of understanding the conditions and emotions of a country than by studying its art, for the artist is concerned, not with propaganda nor with patriotism, but with pinning down as sincerely as he can his own reactions to the things around him. And it is from this point of view that the forthcoming Exhibition of Soviet Art at the Bloomsbury Gallery is of especial interest, at a time when there is so much speculation as to the state of Russia, so many diverse stories of conditions there and so few authentic facts.

The Exhibition, which is to be opened next Monday by H.E. the Ambassador of the U.S.S.R., is under the auspices of the London Society for Cultural Relations between Great Britain and the U.S.S.R., and will be in no way political, but will consist of a large number of contemporary water colours, etchings, woodcuts and oil-paintings portraying scenes of everyday life in Russia, landscapes and types of peasants and workers in the towns. There is also to be a collection of modern Russian books, chiefly of the edition de luxe type, whose appeal lies in their presentation and illustrations, as well as in their letterpress.

In the meantime the Bloomsbury Gallery is showing a smaller but in many ways equally interesting collection of charcoal drawings by Madame Tarnay, a Viennese artist. Almost all the drawings are satirical caricatures of social life, reminiscent of Daumier in feeling, but individual in treatment. Many of them are drawings of London Streets, bitterly humorous, and almost all conceived from a cruel and slightly distorted point of view. One of the most telling, but also perhaps the most sordid, is the drawing called "Wales." The Exhibition is well worth a view, if only for the fascination of seeing ourselves as at least one other sees us.

The Year Book Press Series of Plays.—The Year Book Press, 31 Museum Street, has issued a catalogue of one-act plays called "Plays and their Plots." The series is edited by Mr. G. W. Bishop, the theatrical correspondent of *The Observer*, and the catalogue, which will be sent on application, gives a comprehensive resumé of the plot of each play, the number of characters, and the acting time. It is primarily intended to assist village drama societies which experience difficulty in finding good one-act plays which are within their means to produce.

REPORT ON THE COMPETITION OF INDUSTRIAL DESIGNS, 1930

INTRODUCTION

In presenting the report on the Annual Competition of Industrial Designs for 1930 it is gratifying to note that there was again an increase in the number of competitors and that students of Schools of Art were again well represented. The general standard of work showed a marked advance on previous years, and it is becoming increasingly clear that the work to which the Royal Society of Arts put its hand seven years ago is being more than justified by the results. The carrying on of this Competition from year to year entails heavy expense to the Society, as the entrance fees come far short of the expenditure necessary, and there is no doubt that the Society is conducting a highly useful piece of public work by bringing to the front young designers whose talents but for this Competition would remain hidden.

Manufacturers and others are showing their appreciation of the value of this Competition by coming forward in increasing numbers with the offer of prizes in connection with their special requirements, and it is a pleasing fact that in many instances their interest has been rewarded by the discovery of designers whose work has been of great assistance to them and in some cases permanently so. The Competition is becoming more widely known as time goes on and representatives of the commercial world are realising that well-conceived and suitable designs can be obtained in this country without the

necessity of seeking them on the Continent and elsewhere. "From time to time some exceptionally talented competitor comes to the front and there has been a remarkable instance of this in the Textile Section of the present Competition : a very young competitor is considered to have already made a name for herself by the originality and excellence of her designs. The high standard of this year's Exhibition has been commented on in *The Times*, *The Daily Telegraph*, and most of the important newspapers and its practical influence in connection with Industrial Art is receiving wide recognition.

The Council wish to express the desirability of Art teachers acquiring a fuller knowledge of the requirements of manufacturers on the question of the suitability of designs for industrial purposes. It is interesting to note that in several cases where Art teachers have previously made this a special study, their students have been highly successful, and in one or two instances where teachers have left one district for another, they carry the success of their students with them. This has been very definitely exemplified in this year's Competition. Many designs are shown, which, while good and well executed in themselves, show an entire lack of knowledge of the technical requirements which are necessary for particular purposes, and young students cannot be expected to have the requisite knowledge unless it is in the first instance inspired by those who are instructing them. The Council recommend that Art teachers should, wherever possible, make a point of visiting the Exhibition in order that they may see for themselves the general requirements.

In no less than 18 Schools of Art every design submitted was rejected, and it would appear that in these the designs were drawn on stereotyped lines instead of an attempt being made to adapt them to present-day conditions. A good many designs were submitted which, from the point of view of drawing and execution, were of a very low standard, and, in fact, such as to make it clear that the students could never hope to attain success. For this reason the Council strongly recommend that in future Competitions Art teachers should make themselves responsible for seeing all the work produced by their students before it is entered. This would be helpful, not only to the judges, but also to the students themselves, as they are apt to acquire a completely wrong impression as to the value of their work, and it would be much better that they refrained from sending in designs until such time as they are in a position to have a reasonable chance of success. The need for closer collaboration between the Art School and the Manufacturer is very clearly emphasised in the Report of H.M. Inspectors on "Design and the Cotton Industry."

It is again gratifying to note that awards have been made in this year's Competition to British competitors from Canada, Australia, South Africa, India, Paris and Munich. It is also highly satisfactory to note that in a large number of instances the awards were made to young students whose ages range from 18 to 25. The Council once more wish to emphasise that a Bureau of Information is kept by the Society for the registration of the names of exhib-

itors. In this way manufacturers can get in touch with exhibitors, and through its medium many have already obtained very useful results.

The Council wish to allude with great regret to the loss which has been sustained by the death of Sir Frank Warner, K.B.E., who was primarily responsible for originating the Competition under the auspices of the Royal Society of Arts. Few people have done more than Sir Frank to stimulate and improve Art in connection with Industry, and his personality and influence will be difficult to replace.

The Council desire to express their thanks to the donors of prizes, whose interest and generosity have helped materially in the continuance and advancement of the Competition; to the judges for their voluntary services so ably and willingly given; to the Rector and Staff of the Imperial College of Science and Technology for affording accommodation and necessary facilities for receiving, unpacking and classifying the designs; and to Lieut.-General Sir William Furse, K.C.B., D.S.O., Director of the Imperial Institute, for the use of the Exhibition Pavilion for the judging of the designs and for permitting the Exhibition to be held there. The Council also wish to express their recognition of valuable help given by the Press in making the competition so widely known and in expressing appreciation of the work carried out by the Society.

NUMBER OF ENTRIES

The total number of competitors who entered for the various sections of the Competition was 1,225. Of these, 840 were students of Schools of Art, and 376 non-students.

The number (of mounts) of designs submitted was 3,503,* divided as follows:—

ARCHITECTURAL DECORATION —Sub-Section 1, 78; Sub-Section 3 (Messrs. Bagnès, Ltd.), 24; Sub-Section 4 (Messrs. Bratt, Colbran and Co.), 36; Sub-Section 5 (Messrs. Chance Bros. and Co., Ltd.), 30; Sub-Section 6 (Messrs. Hailwood and Ackroyd, Ltd.), 10; Sub-Section 7 (The Malkin Tiles (Burslem) Ltd.), 23; Sub-Section 8 (Messrs. Smith and Wellstood, Ltd.), 4; Sub-Section 9 (Messrs. J. Wippell and Co., Ltd.), 36; Sub-Section 10 (a) (The Morris-Singer Co.), 23; Sub-Section 10 (b) (The Morris-Singer Co.), 9

9	Total
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273

TEXTILES —Sub-Section 1 (The Tootal Broadhurst Lee Co.), 175; Sub-Section 2 (Messrs. W. Foxton, Ltd.), 61; Sub-Section 3 (Morton Sundour Fabrics, Ltd.), 58; Sub-Section 4 (Messrs. Simpson and Godlee, Ltd.), 133; Sub-Section 5 (Messrs. Story and Co., Ltd.), 10; Sub-Section 6 (Messrs. Turnbull and Stockdale, Ltd.), 127; Sub-Section 7 (Messrs. Warner and Sons, Ltd.), 32; Sub-Section 8 (British Celanese, Ltd.), 306; Sub-Section 9 (British Celanese, Ltd.), 61; Sub-Section 10 (Messrs. F. W. Grafton and Co., Ltd.), 121; Sub-Section 11 (Messrs. Simpson and Godlee, Ltd.), 121; Sub-Section 12 (British Celanese, Ltd.), 24; Sub-Section 13 (The Macclesfield Silk Trade Employers' Association), 19; Sub-Section 14 (Calico Printers' Association), 15; Sub-Section 15

(Messrs. Brintons, Ltd.), 62 ; Sub-Section 16 (Messrs. Lister and Co., Ltd.), 42 ; Sub-Section 17 (Messrs. Lister and Co., Ltd.), 12 ; Sub-Section 18 (Morton Sundour Fabrics, Ltd.), 7 ; Sub-Section 19 (Exors. of Mrs. Lewis F. Day), 48 ; Sub-Section 20 (Messrs. James Pearsall and Co., Ltd.), 38 ; Sub-Section 21 (a) (Messrs. A. Herbert Woolley and Co., Ltd.), 14 ; Sub-Section 21 (b) (Messrs. A. Herbert Woolley and Co., Ltd.), 3 ; Sub-Section 22 (Sir Frederick Richmond, Bt.), 4 ; Sub-Section 23 (Sir Frederick Richmond, Bt.), 9	Total	1,502*
FURNITURE :—Sub-Section 1, 104 ; Sub-Section 2 (London Cabinet and Upholstery Trades Federation), 22 ; Sub-Section 3 (Peninsular and Oriental Steam Navigation Co.), 28	.. .. . Total	154
BOOK PRODUCTION :—Sub-Section 1, 74 ; Sub-Section 2, 6 ; Sub-Section 3, 60 ; Sub-Section 4, 105 ; Sub-Section 5, 59 ; Sub-Section 6 (National Book Council), 14	.. .. . Total	318
POTTERY AND GLASS :—Sub-Section 1, 50 ; Sub-Section 2, 52 ; Sub-Section 3, 11 ; Sub-Section 4, 28 ; Sub-Section 5, 28	.. .. . Total	169
ADVERTISING :—Sub-Section 1 (Blackpool Corporation Publicity Committee), 43 ; Sub-Section 2 (British Electrical Development Association), 16 ; Sub-Section 3 (British Poster Advertising Association), 160 ; Sub-Section 4 (Celestion, Ltd.), 38 ; Sub-Section 5 (Messrs. E. K. Cole, Ltd.), 9 ; Sub-Section 6 (The Cunard Steam Ship Co., Ltd.), 87 ; Sub-Section 7 (Messrs. Henley's Tyre and Rubber Co.), 58 ; Sub-Section 8 (The Orient Line), 111 ; Sub-Section 9 (The Prudential Assurance Co., Ltd.), 16 ; Sub-Section 10 (Messrs. Watney Combe Reid and Co., Ltd.), 42 ; Sub-Section 11 (British Celanese, Ltd.), 114 ; Sub-Section 12 (Sir Joseph Causton and Sons, Ltd.), 34 ; Sub-Section 13 (Messrs. W. T. Henley's Telegraph Works Co., Ltd.), 15 ; Sub-Section 14 (Messrs. Maconochie Bros., Ltd.), 42 ; Sub-Section 15 (Messrs. Rowntree and Co., Ltd.), 74 ; Sub-Section 16 (Messrs. Simpson and Godlee, Ltd.), 12 ; Sub-Section 17 (Shell-Mex, Ltd.), 43 ; Sub-Section 18 (Messrs. Jas. Shoolbred and Co., Ltd.), 9 ; Sub-Section 19 (Messrs. Jas. Shoolbred and Co., Ltd.), 36 ; Sub-Section 20 (Sir Joseph Causton and Sons, Ltd.), 12 ; Sub-Section 21 (a) (Messrs. E. W. Savory, Ltd.), 41 ; Sub-Section 21 (b) (Messrs. E. W. Savory, Ltd.), 65 ; Sub-Section 22 (Messrs. E. W. Savory, Ltd.), 49 ; Sub-Section 23 (British Celanese, Ltd.), 51	.. .. . Total	1,177*
Total for all Sections		3,593*

*In certain Sub-Sections of the Competition, competitors were required to enter sets of three, six or eight designs, and many of the mounts contained more than one design. The total number of designs submitted this year in the Textile Section was therefore 2,163 and in the Advertising Section 1,299, and the total number of actual designs received for all Sections of the Competition this year was 4,359.

The Schools of Art from which competitors entered were:—[The numbers in brackets show the number of competitors from each School.]

Architectural Association School of Architecture (2); Barnstaple School of Art (2); Bartlett School of Architecture (University of London) (3); Bath School of Art (2); Batley School of Art and Crafts (3); Battersea Polytechnic School of Art (15); Beath Secondary School (1); Belfast School of Art (1); Bideford School of Art (1); Birmingham School of Arts and Crafts (6); Blackburn Art School (6); Blackheath (Lee, Lewisham and Greenwich) School of Art and Crafts (3); Blackpool Technical Evening School (1); Bolton School of Art (2); Bournemouth Municipal College School of Art (14); Bournville School of Art (1); Bradford School of Art and Crafts (5); Brighton Municipal School of Art (2); Bristol Municipal Art School (5); British and Dominions School of Drawing, Ltd. (13); Brixton L.C.C. School of Building (1); Bromley School of Art (1); Burnley Municipal School of Art (1); Burslem School of Art (39); Burton-on-Trent Municipal School of Arts and Crafts (1); Bury School of Art (1); Camberwell School of Arts and Crafts (14); Carlisle School of Art (1); Sir John Cass Technical Institute (3); L.C.C. Central School of Arts and Crafts (26); Chelsea Polytechnic School of Art (14); Chester School of Art (1); Chesterfield School of Art and Crafts (2); Chiswick Polytechnic School of Art (2); Clapham School of Art (1); Coalbrookdale School of Science and Art (1); Colchester School of Art (1); Coventry School of Art (2); Croydon School of Art (6); Darlington School of Art (1); Doncaster School of Art (2); Dover School of Art (5); Dublin School of Art (4); Dunedin (N.Z.) School of Art (3); Eastbourne School of Arts and Crafts (1); Edinburgh College of Art (29); Farnham School of Art (4); Gainsborough Art School (1); Glasgow Royal Technical College (1); Glasgow School of Art (25); Glossop School of Art (6); Gloucester Municipal School of Arts and Crafts (2); Goldsmiths' College School of Art (University of London) (4); Grosvenor School of Modern Art (1); Great Yarmouth School of Art (1); Guildford School of Art (1); Hackney Technical Institute School of Art (3); Halifax School of Art (8); Hammersmith L.C.C. School of Arts and Crafts (7); Hanley School of Art (3); Harrogate College School of Art (5); John Hassall Correspondence Art School (3); Hastings Municipal School of Art (10); Heatherley School of Art (5); High Wycombe School of Art (11); Hornsey School of Art (17); Hove, Wick Studio (3); Hyde School of Art (2); International Correspondence Schools, Ltd. (30); Ipswich School of Arts and Crafts (3); Keighley School of Art and Crafts (12); Kidderminster School of Art (20); Kingston Art School (3); Lancaster Municipal School of Art (2); Leeds College of Art (26); Leek School of Art (2); Leicester College of Art (1); Lewes School of Art (1); Leyton School of Art (2); Liverpool City School of Art (54); Liverpool University School of Architecture (1); Llanelly School of Art (1); London School of Printing and Kindred Trades (4); Longton School of Art (1); Loughborough College School of Art (5); Lowestoft School of Arts and Crafts (1); Lydney School of Art (1); Macclesfield School of Art (15); Maidstone School of Art and Crafts (1); Manchester Municipal School of Art (46); Middlesbrough, Constantine Technical College (2); Montreal Art Association (1); Newcastle-under-Lyme School of Art (4); Northampton School of Arts and Crafts (6); Northern Polytechnic (1); Norwich School of Arts and Crafts (2); Norwood L.C.C. Technical Institute (2); Nottingham Correspondence College for Applied Designs, Ltd. (2); Nottingham School of Art (22); Oldham Municipal School of Art (1); Oxford, Ruskin School of Drawing (2); Paddington L.C.C. Technical Institute (1); Photo-Engraving and Lithography, L.C.C. School of (1); Plymouth Central School of Arts and Crafts (1); Portsmouth Municipal School of Art (1); Prahran (Australia) Technical School (2); Preston School of Art (8);

Putney L.C.C. School of Art (5); Reading University School of Art (1); Reay Central School (4); Regent Street Polytechnic Schools of Art and Architecture (3); Rochdale School of Art (9); Royal Academy Schools (3); Royal College of Art (20); Royal Drawing Society (1); Royal School of Needlework (1); St. Albans School of Art (1); St. Martin's School of Art (6); Salford School of Art (22); Salisbury School of Art (1); Sheffield College of Arts and Crafts (26); Shoreditch Technical Institute (1); Shrewsbury, Boys' Priory School (1); Skipton School of Art (6); Slade School of Art (University College) (5); Southampton School of Arts and Crafts (10); Southend-on-Sea School of Arts and Crafts (2); Spring Grove Polytechnic School of Art (1); Stalham School of Arts and Crafts (2); Stockport College School of Arts and Crafts (7); Stoke-on-Trent School of Art (4); Stourbridge School of Arts and Crafts (6); Stroud Art School (1); Sunderland School of Art (2); Sunnyhill Road L.C.C. Evening Institute School of Art (1); Surat (India) Drawing and Design Class (2); Swansea Municipal School of Art and Crafts (1); Swindon School of Art (2); Sydney (N.S.W., Australia) Art School (1); Teddington Art School (1); Thornleigh Studio (3); Vancouver (Canada) School of Decorative and Applied Arts (1); Wallasey School of Art (1); Watford School of Art (5); West Bromwich, Ryland Memorial School of Art (6); Westminster Technical Institute School of Art (4); Weston-super-Mare School of Art (1); Widnes Municipal Technical College (1); Wimbledon School of Art (1); Wolverhampton School of Art and Crafts (1); Woolwich Polytechnic School of Art (2); Wordsley School of Art (6); Yeovil Art School (1); York School of Art (1).

REPORTS OF JUDGES

JAMES H. HYDE TRAVELLING SCHOLARSHIP

This scholarship, of the value of £100, given by James H. Hyde, Esq., is offered under the terms of the competition "to the competitor between 17 and 30 years of age whose designs show the greatest merit in respect of invention and draughtsmanship in the Section of Architectural Decoration or Textiles." A similar scholarship was offered two years ago, in the 1928 competition, and on that occasion it was awarded to a competitor in the Architectural Decoration Section. This year it is awarded by the Judges, subject to the conditions stated in the Prospectus of the competition, to:

Miss Mary Kirby, Slade School of Drawing, Painting and Sculpture, University of London.

Miss Kirby was awarded the Tootal Broadhurst Travelling Studentship in Sub-Section 1 of the Textile Section, and the First Prize in Sub-Section 11, and was also highly commended in Sub-Section 8.

ART CONGRESS STUDENTSHIP

The Art Congress Studentship of the value of £50 is open, under the conditions of the competition, to any candidate in any Section. The Studentship is awarded by the Judges to:

Harold Hemingway, Rochdale School of Art. This competitor was awarded the First and Third Prizes in Sub-Section 8 of the Textile Section, and was commended in Sub-Section 15.

"OWEN JONES" MEDALS

Bronze medals offered under the "Owen Jones" Trust to competitors who are Students in British Schools of Art and kindred Institutions are awarded by the Judges to the following:

Textile Section.

Miss Jean Margaret Mabel Cowan, Edinburgh College of Art, for design No. 3317 in Sub-Section 4.

Miss Vida Davidson, Glasgow School of Art, for design No. 3449 in Sub-Section 7.

Book-Production Section.

Miss Isobel Elizabeth Board, Liverpool City School of Art, for her design No. 3148 in Sub-Section 4.

Advertising Section.

Clarence Scott, Leeds College of Art, for design No. 991 in Sub-Section 8.

SECTION I.—ARCHITECTURAL DECORATION

SUB-SECTION 1. *Prize offered by the Royal Society of Arts under the Mulready Trust for a set of three Black and White Drawings of Architectural Subjects in any town or district.*

The awards are as follows:—

The Prize of £20 to Harold Frank Hoar, Bartlett School of Architecture, University College (No. 1786).

Highly Commended:

Dennis Edmund John Harrington, 77 New Cross Road, S.E.14 (Nos. 1643 and 1644).

Frederick Ernest Kerswill, Bartlett School of Architecture, University College (Nos. 360 to 365).

Francis Graham Lodge, 2 Celia Mansions, 294 Camden Road, N.7. (Nos. 624 to 626).

The competition this year is very keen, and the Judges are agreeably surprised to find a diverse choice of subjects, proving that the competitors are conversant with current events in London and other cities. The subject is essentially an architectural one in the sense that perspective and architectural values are required as topographical statements. A general high level has been maintained. Competitors should avoid vignetting drawing and should concentrate on filling the paper.

The Prize is awarded to No. 1786 (H. F. Hoar), a brilliant pen and ink drawing of the west front of Bourges Cathedral. In this the artist has shown regard for tones and has conveyed a clear statement of detail without obscuring important features by cross-hatching. There is no medium more difficult than pen and ink, and the Judges felt that the masterly treatment out-distanced all other competitors.

Among the drawings highly commended are Nos. 1643 and 1644 (D. E. J. Harrington)—Thames-side views of St. Paul's and Somerset House respectively. This competitor has a style which he could develop. He should devote his attention to drawings by old masters such as Canaletto, Guardi, and later draughtsmen such as Shutterboys. His drawing of the Bank of England does not come up to the standard of his other drawings, being woolly and unequal in tone.

The six drawings by F. E. Kerswill have been highly commended for their free statement and London character. This competitor should develop with experience, but he needs some years of hard drawing to appreciate light and shade.

Three drawings by F. G. Lodge (Nos. 624–626) are also highly commended—Lincoln's Inn Hall, the Gateway of Staple Inn, and the Reform Club. No. 624, the Gateway, Staple Inn, is the best. The Judges feel that these drawings, although poor in execution, were somewhat laboured, and gave the impression of having been studied from photographs. This competitor has power, but he should approach his subjects from the pavement and draw on the spot.

All students would do well to visit this sub-section with a view to competing in future years. The Judges feel that a great advance is being made in topographical drawing, and in this particular branch young English artists are beginning to excel.

SUB-SECTION 2. *Prize offered by Murray Adams-Acton, Esq., for the best Lettering on any sheet of Drawings submitted in the whole Section of Architectural Decoration.*

The award is as follows :—

The Prize of £5 to William Alfred Moffoot, 24 Third Avenue, Selly Park, Birmingham. (Nos. 1184 to 1186 in Sub-Section 5).

The lettering on these designs is extremely good and some of it shows considerable originality with a satisfactory result.

SUB-SECTION 3. *Prizes or Travelling Scholarship offered by Messrs. Bagnès Limited, for a Design for a Metal Screen (in the Norman, perpendicular or modern style) for a small Church. Competitors must not exceed 28 years of age on July 1st, 1930.*

The awards are as follows :—

A First Prize of £30 to Arthur Cecil Adamson, Hammersmith School of Arts and Crafts. (Nos. 2153 to 2156).

A Second Prize of £20 to Raymond Charles Bean, 7 Welbury Street, Dalston, E.8. (Nos. 1291 to 1294).

There was no entry of conspicuous merit and the Judges therefore decided to divide the prize instead of awarding a travelling scholarship.

The three designs by A. C. Adamson are well presented. His Gothic screen, though it is on entirely conventional lines, is not displeasing. His Norman screen is particularly well presented and is imbued with a feeling for the period. The castellated frieze above the arches requires some more definite support at the ends. The main upright bars are on the meagre side.

His modern screen is far from pleasing owing to its restlessness of line and its total lack of ecclesiastical character and association.

The Judges awarded a second prize to R. C. Bean for his modern screen, which shows a distinct recognition of the requirements. It suitably conveys an expression of its religious associations, and at the same time it is modern. Its lateral stability is open to suspicion. Unfortunately, this competitor fails badly both in his Norman and Gothic designs. None of his drawings are well presented.

The presentation of constructional details by E. F. Cresser (Nos. 514-517) was admired by the Judges.

SUB-SECTION 4. *Prizes offered by Messrs. Bratt Colbran and Company and the Heaped Fire Company Limited, for a Design for a Fireplace.*

The awards are as follows :—

The First Prize of Twenty Guineas to Francis Frederick Johnson, School of Architecture, Leeds College of Art. (No. 2643).

Commended :

Kenneth Mortimer Angus, 34 Torrington Place, North Road, Plymouth. (No. 1073).

Norman Holmes, 465 Brunshaw Road, Burnley. (No. 1386).

Donald Milne Williamson, Sheffield College of Arts and Crafts. (No. 2864).

The standard of designs is generally poor. Where modern or original designs have been shown there is a lack of restraint, and in few cases has the effect been considered in conjunction with any sound decorative scheme for the room of which

it should be the feature. In many cases the mantel-piece is much too heavy for the size of fire shown, and often perishable materials are placed too near the heat zone.

Many competitors have designed for strict elevation only without thought of perspective, while the full sizing of the fireplace has not been sufficiently taken into account. There is too much intricate detail carried out in expensive materials, producing a muddled and complicated effect.

SUB-SECTION 5. Prizes offered by Messrs. Chance Brothers and Company Limited, for Designs for a Glazed Screen for a fashionable Hotel.

The awards are as follows :—

The first prize of £35 to Harold John William Hyde, Croxbottom Cottage, Newton St. Loe, Nr. Bristol. (No. 136).

The Second Prize of £15 to Edwin John Storry, School of Architecture, Leeds College of Art. (No. 2652).

Commended :

Frederick Ernest Osborne, 41 St. Georges Road, Victoria, S.W.1. (Nos. 749 and 750).

Most of the designs failed through lack of proper interpretation of the conditions and inadequate understanding of the structural possibilities.

Several designs were quite pleasing in themselves, but were quite unsuitable to their situation in a "fashionable hotel." In several cases the praiseworthy attempts to achieve lively and cheerful effects degenerated into the production of restless and irritating designs.

In so far as structure is concerned many competitors allowed for glazing bars of quite unnecessary weight and thickness, and thereby produced unnecessarily ponderous and expensive schemes. Few competitors who used small panes availed themselves of the wide possibilities of electro-copper glazing, as a strong and very light system, which has useful decorative possibilities.

Generally speaking, the most satisfactory designs were those which were most direct, and took into account the facts that glass is obtainable in large sheets ; that the cost of glazing a pane is often more than that of the pane itself ; and that fine effects can be produced by good proportions and broad surfaces.

SUB-SECTION 6. Prize offered by Messrs. Hailwood and Ackroyd, Limited, for a Design of an Electrical Illuminating Fitting to occupy the central position in a room, with Wall Bracket Fitting to match, designed in modern style.

The awards are as follows :—

The Prize of Ten Guineas to John Arthur Cecil Howard, 90 Palmerston Road, Bowes Park, N.22. (Nos. 1636 and 1637).

Highly Commended :

Arthur Collett, Ryland Memorial School of Art, West Bromwich. (Nos. 531 to 533).

The Judges are disappointed at the small number of entries for this sub-section, in view of the important part played by electric light fittings in the general decorative effect of a room. Possibly the poor entry may be due to a reluctance on the part of designers to give their attention to the Glass Industry which has in recent years been badly hit by foreign competition.

The Prize has been awarded to J. A. C. Howard's designs (Nos. 1636 and 1637), which it is felt will distribute light in the most attractive manner ; the character

of the design of the central light is satisfactorily echoed in the wall bracket. The designs Nos. 531-533 by A. Collett, which are highly commended, are well worked out in their structural details.

SUB-SECTION 7. Prizes offered by the Malkin Tiles (Burslem), Limited, for a design for a Dull Glazed Surround to suit a Wood Mantel Opening for a Dining Room or Lounge in a modern room.

The awards are as follows :—

The First Prize of £10 to Thomas B. Jones, Burslem School of Art. (No. 3283).

Highly Commended :

Francis William Mudd, Architectural Association School of Architecture.

The competition is very disappointing, apart from the prize-winning design and the one highly commended. The designs should be simpler in construction and more original.

SUB-SECTION 8. Prizes offered by Messrs. Smith and Wellstood, Limited, for Designs for an Anthracite Stove.

The Judges were unable to recommend that the full amount of the Prizes offered should be given, but the following award was made :—

A Prize of £10 to Miss Vera Maud Moller, 123 Hampstead Way, Golders Green, N.W.11. (No. 1531).

The entries in this class are disappointingly few. Miss Vera Moller's design, (No. 1531), is the only design which shows distinctive originality, but could not very easily be made to suit necessary internal construction. Designs Nos. 1667, 1668 and 1741 were too reminiscent of present design. Competitors did not show sufficient knowledge of the practical working of an anthracite stove.

SUB-SECTION 9. Prizes offered by Messrs. J. Wippell and Company, Limited, for Designs for a Litany Desk in Wood.

The awards are as follows :—

The First Prize of Ten Guineas to Ernest John Weir, 13 Caledonian Road, Edinburgh. (Nos. 1518 and 1519).

The Second Prize of Five Guineas to Terence Carr, "Garthowen," Hockering Gardens, Woking, Surrey. (No. 779).

Highly Commended :

George Hay, Edinburgh College of Art. (Nos. 3348 and 3349).

Commended :

Terence Carr, "Garthowen," Ardsraig Gardens, Woking, Surrey. (No. 778).

Gerald Cogswell, 2 Bedford Square, W.C.1. (No. 832).

In awarding the First Prize to E. J. Weir the Judges would like to place on record their opinion that, considering the student's age, a very high standard has been reached in this design. The execution of the sketch and the ability to portray full-size sections is praiseworthy.

They also feel that the whole of the exhibits in this particular sub-section are, with one or two exceptions, of a very high standard, and superior to the general run of entries.

Design No. 779, by T. Carr, is awarded the Second Prize. Only a sketch was supplied, and no full-size details, which the Judges consider a serious omission.

In highly commending Nos. 3348/9, by G. Hay, the Judges feel that, considering his extreme youth, his drawing reaches a higher standard than any other design in this sub-section. The detail is also the best.

Design No. 832, by G. Cogswell, is commended for its artistic merits.

SUB-SECTION 10 (a). *Prizes offered by the Morris-Singer Company for a Design for a Wrought Iron Entrance Door for a high-class West End Business Shop.*

The awards are as follows :—

The First Prize of Ten Guineas to William Alfred Guttridge, School of Architecture, Leeds College of Art. (Nos. 2632 and 2633).

The Second Prize of Six Guineas was equally divided and a Prize of Three Guineas was awarded to :—

Frank Alfred Gardner, 131 Winston Road, Stoke Newington, N.16. (No. 546) ; and

Miss Vera Maud Moller, 123 Hampstead Way, Golders Green, N.W.11. (No. 1532).

Commended :

Roland Morris, 12 Sydenham Hill, S.E.26. (Nos. 640 and 641).

The designs as a whole were considered to be very good.

The design by W. A. Guttridge (Nos. 2632 and 2633), which was awarded the first prize, was considered to comply with the conditions, that is, to be a graceful modern French metal-work treatment. Some of the competitors showed original and interesting ideas, well rendered, but their design did not comply with the above-mentioned condition.

No. 1532, by Miss V. M. Moller, was a charming original design, but lost marks owing to the poor lettering on the name-plate.

No. 546, by F. A. Gardner, who halved the second prize with Miss Moller's design, (No. 1532), is a beautifully drawn design, with a watchmaker's motifs cleverly introduced, but the octagonal centre shape was considered weak.

Nos. 640/1, by R. Morris, were good in general layout, but the figure motifs are not suitable for wrought iron.

No. 1784, by C. F. Gallett, is too elaborate and would be too costly in execution

SUB-SECTION 10 (b). *Prizes offered by the Morris-Singer Company for a Design for Leaded Glazing for a Metal Staircase Window upon a half landing opposite to the above-mentioned door (Sub-Section 10 (a)) of a different design but to harmonise with the door.*

Owing to the lack of suitable entries the Judges were unable to recommend that the full amount of the Prizes offered should be given, but the following awards were made :—

A Prize of Six Guineas to John Rodger Sime, Nottingham School of Art. (No. 3121).

Highly Commended :

John Rodger Sime, Nottingham School of Art. (No. 3118).

The second half of this sub-section did not produce such interesting work. The designs generally lacked architectural feeling and showed want of knowledge of the limitations of the materials. The design by J. R. Sime (No. 3121), which was awarded a prize, was over-elaborate, but was suitable for the material and would work out well in practice.

SECTION II.—TEXTILES.

SUB-SECTION 1. *A Travelling Studentship of £75 offered by the Tootal Broadhurst Lee Company, Limited, for a set of at least eight designs suitable for Woven or Printed Dress or Furnishing Materials. Competitors must not be more than 24 years of age.*

The Travelling Studentship of £75 offered by the Tootal Broadhurst Lee Company is awarded to :—



Textiles. Sub-Section I. Miss Mary Kirby. Design No. 1942.



Textiles. Sub-Section I. Miss Mary Kirby. Design No. 1943.

Miss Mary Kirby, Slade School of Drawing, Painting and Sculpture, University of London. (Nos. 1932 to 1952).

The following awards are also made :—

A Royal Society of Arts Prize of Five Guineas to Miss Margaret Winifred Christmas, 14 Glebe Court, Highfield, Southampton. (Nos. 1311 to 1320).

Highly Commended :

Miss Alice Schneebaum, St. Martin's School of Art. (Nos. 1818 to 1822).

Commended :

Miss Phyllis Tordoff Firth, Oldham School of Art. (Nos. 2789, 2791 to 2793, 2795 and 2796).

Stanley James Robert Leeming, Colchester School of Art. (Nos. 1149, 1150 and 1155).

The Judges are disappointed to find a smaller number of entries than formerly, which apparently indicates less keen interest. There is one outstanding set of 21 designs sent in by Miss Mary Kirby, to whom the Judges unanimously and unhesitatingly award the Studentship. Her designs show originality, good composition and arrangement, and good taste in colour, coupled with intelligent drawing. A set of ten designs by Miss Margaret Winifred Christmas are of good general quality. It is disappointing to find that, while the number of entries this year is smaller, the number of rejections is greater in proportion, although the standard of the winner of the Studentship is as high as that of any previous year.

They are interested to see the studies submitted by Mr. Norman Wilkinson, the winner of last year's Studentship, but regret that he was unable to show a somewhat larger number.

SUB-SECTION 2. Prize offered by Messrs. W. Foxton, Ltd., for an abstract, or combination of abstract and floral design, suitable for Cretonne for average-sized rooms.

The awards are as follows :—

The Prize of Fifteen Guineas to Miss Denise Marian Shakerley, Royal College of Art. (No. 1991).

Highly Commended :

Miss Denise Marian Shakerley, Royal College of Art. (No. 1989).

Commended :

Miss Mary Cook, Glasgow School of Art. (No. 3446).

Charles Tomrley, 29, Tanza Road, Hampstead, N.W.3. (No. 1243).

The designs as a whole are disappointing. Several of those which exhibit imaginative qualities on modern lines seem to have lost, in the working out, much of the spirit which inspired the original scheme. Miss D. M. Shakerley's design (No. 1991), to which the prize is awarded, is the freshest and most pleasing example.

The tendency for competitors to take the productions of the prize-givers and to try to do something on the same lines, is a definitely bad thing to do. Students should be more adventurous.

SUB-SECTION 3. Prizes offered by Morton Sundour Fabrics, Limited, for designs for Printed Cretonne.

The Judges were unable to recommend that the full Prizes should be given, but the following awards were made :—

A Prize of £12 10s. each to the following :—

Stanley James Robert Leeming, Colchester School of Art. (No. 1163).

Miss Jean Motherwell Brown Paisley, Edinburgh College of Art. (No. 3377).

Highly Commended :

Miss Helen Leslie Isabel Jaffrey, Edinburgh College of Art. (No. 3351).

The Judges are disappointed with the quality of the designs submitted and for this reason are withholding the award of the first prize, and have merged the second and third prizes into two prizes of equal value.

Many of the competitors have failed to confine their designs to the limitations in regard to number of colours stated in the specification, and for this reason have not qualified.



Textiles. Sub-Section IV. Miss Jean M. M. Cowan. Design No. 3317.

SUB-SECTION 4. Prizes offered by Messrs. Simpson and Godlee, Limited, for designs suitable for Cretonnes.

The awards are as follows :—

The First Prize of Twenty-five Guineas to Miss Jean Margaret Mabel Cowan, Edinburgh College of Art. (No. 3317).

The Second Prize of Fifteen Guineas to Alan Stenhouse Gourley, Edinburgh College of Art. (No. 3336).

The Third Prize of Ten Guineas to Miss Margaret Enid Lilian Leeds, Edinburgh College of Art. (N. 3357).

Very Highly Commended :

Miss Jean Margaret Mabel Cowan, Edinburgh College of Art. (No. 3318).

Commended :

Miss Laura Mary Morison, Edinburgh College of Art. (No. 3375).

The Judges consider the exhibits of average merit. They are surprised to find how few have conformed to the conditions laid down as to number of colours, repeat, etc.

Students should concentrate on originality and break away from the orthodox, while at the same time avoiding grotesqueness by bearing in mind the serviceability of the finished article.

SUB-SECTION 5. Prizes offered by Messrs. Story and Co., Ltd., for a design with the best features of the late 18th and early 19th century work for Printed Cretonne.

The awards are as follows :—

The First Prize of Fifteen Guineas to Miss Rosalie Handley, L.C.C. Central School of Arts and Crafts. (No. 1653).

The Second Prize of Ten Guineas to Miss Winifred Thorburn, Edinburgh College of Art. (No. 3397).

Highly Commended :

Mrs. Bertram F. Sargeaunt, Belmont, Douglas, Isle of Man. (No. 1226).

Commended :

Miss Ina Taylor, 33 Havelock Place, Shelton, Stoke-on-Trent. (No. 1228).

Miss Rosalie Handley's design (No. 1653), to which the first prize is awarded, has coherence and substance, and the colours blend well. It is well adapted, both as regards design and distribution of colouring, to modern methods of production.

Miss Winifred I. Thorburn's design (No. 3397), which secures the second prize, shows a lighter treatment than No. 1653. In this respect it follows more closely the style of design prevalent in the early years of the last century, when draperies were less full than formerly and slighter patterns were preferred.

In Mrs. B. F. Sargeaunt's design (No. 1226), which is highly commended, the thinness of line and detail is again in accordance with the period specified in the terms of the competition, but in this instance it is carried to a degree which outsteps practical limits. Its reproduction might be possible on silk, or in embroidery, but on heavier materials the printing of the thin stems would be a matter of difficulty, and details on which the effect of the whole design depends might be lost.

Miss Ina Taylor's design (No. 1228) is also commended. The treatment is too modern to come fully within the terms of the competition, but the design has decided merit.

SUB-SECTION 6. Prizes offered by Messrs. Turnbull and Stockdale, Limited, for designs—judged on their imaginative qualities with due regard to form, colour value and usefulness—intended for either machine or hand block printed Cotton or Linen. Open to students, or designers serving apprenticeship, not exceeding 24 years of age.

In view of the first three designs being of equal merit, the two prizes have been pooled and a Prize of Eight Guineas each is awarded to the following :—

Miss Kathleen Mary Gerry, L.C.C. Putney School of Art. (No. 2237).

Sydney Harry, Leeds College of Art. (No. 2640).

Miss Marjorie Isabel Spencer, L.C.C. Central School of Arts and Crafts. (No. 1198).

Highly Commended :

Miss Doreen Davidson, Edinburgh College of Art. (No. 3327).

Miss Marjorie Joyce Dunlop, Southampton School of Arts and Crafts. (No. 2986).

Sydney Harry, Leeds College of Art. (Nos. 2638 and 2639).

Miss Elene Electra Mangoletsi, Slade School of Drawing, Painting and Sculpture, University of London. (No. 1975).

Miss Dora Fretson Peace, Hornsey School of Art. (No. 1693).

Miss Grace E. Potts, Manchester School of Art. (No. 2750).

Miss Marjorie Isabel Spencer, L.C.C. Central School of Arts and Crafts. (No. 1197).

Miss Kathleen Stenhouse, Glasgow School of Art. (No. 3405).

Miss Jean Philip Todd, Glasgow School of Art. (No. 3436).

Commended :

Miss Margaret Ithell Colquhoun, Slade School of Drawing, Painting and Sculpture, University of London. (No. 1898).

Miss Barbara Evelyn Freeman, Royal College of Art. (No. 539).
 Miss Margaret Gill, Halifax Technical College School of Art. (No. 2538).
 Miss Marion Hamilton, Glasgow School of Art. (No. 3411).
 Miss Nora Patricia Hill, Croydon School of Art. (No. 2082).
 Miss Freda Mary Honour, Liverpool City School of Art. (No. 3192).
 Miss Muriel Doris Hooper, Sheffield College of Arts and Crafts. (No. 924).
 Miss Margaret Louise Parr, Manchester School of Art. (No. 2744).
 Miss Marjorie Isabel Spencer, L.C.C. Central School of Arts and Crafts. (No. 1196).

Miss Kathleen Stenhouse, Glasgow School of Art. (Nos. 3404 and 3406).

This is a distinctly better competition than last year, and the designs had more suitability for use than in any previous year. The designs in the modern movement were distinctly better, but, on the other hand, too much work was submitted that was "pirated" tradition rather than designs made with a proper traditional inspiration.



Textiles. Sub-Section VII. A E. Stenlake Design No. 1494.

SUB-SECTION 7. Prizes offered by Messrs. Warner and Sons, Ltd., for designs of any recognised period, or of a modern tendency, for hand-block Fabrics. Competitors must not be more than 25 years of age.

The Judges were unable to recommend that the full prizes should be given, but the following awards were made :—

A Prize of £25 to Alfred Edward Stenlake, 32 Victoria Road, Kentish Town, N.W.1. (No. 1494).

A Prize of £15 to Miss Vida Davidson, Glasgow School of Art. (No. 3449).

Highly Commended :

Francis Walker, Manchester School of Art. (No. 2787).

Commended :

Miss Lilius M. A. Farley, School of Decorative and Applied Arts, Vancouver, Canada. (No. 343).

The entries for this section are disappointing. The works submitted are few, and the general standard is lower than might have been expected. The first prize is not awarded.

Alfred Stenlake's design (No. 1494) has merits from the point of view of adaptability for reproduction, but the colouring is poorly conceived. The other designs submitted by this student (Nos. 1492, 1493, 1495) are on more traditional lines, and lacking in originality. The floral treatment of Miss Vida Davidson's design (No. 3449) is very skilful, and, but for the weakness in the arrangement of the pigeons, which would have a monotonous effect in the fabric, the design would have gained a higher award. There is an excess of formality in the other design (No. 3450) submitted by this student. Francis Walker's design (No. 2787) is highly commended for originality and breadth of treatment. Miss Edith Sharpe's design (No. 2860) shows much promise, though the colour is weak. Miss Lilius M. A. Farley's design (No. 343) is commended for force and originality. It is not quite suitable for the section in which it is submitted, and it might have experienced better fortune in others. F. Walker's design (No. 2788) combines details of Jacobean design with modern elements. They require blending together more closely.

SUB-SECTION 8. *Prizes offered by British Celanese, Limited, for designs for printing Silk Fabrics for Dress Wear.*

The awards are as follows :—

The First Prize of £15 to Harold Hemingway, Rochdale School of Art. (No. 2946).

The Second Prize of £10 to Harold Watson, 31 Forest Road, Enfield Wash, Middlesex. (No. 2009).

The Third Prize of £5 to Harold Hemingway, Rochdale School of Art. (No. 2947).

Highly Commended :

Miss Margaret Winifred Christmas, 14 Glebe Court, Highfield, Southampton. (No. 1306).

Miss Barbara Heath, 194 Greenvale Road, Eltham, S.E.9. (No. 1630[d]).

Miss Mary Kirby, Slade School of Drawing, Painting and Sculpture, University of London. (No. 1953).

Miss Jeanie Roxburgh, Salford Royal Technical College, School of Art. (No. 2915).

Commended :

George Frederick Ainscow, 17 St. Alban's Street, Rochdale. (No. 2926).

Miss Dorothy Breeze Cartmell, Manchester School of Art. (No. 2714).

Miss Margaret Winifred Christmas, 14 Glebe Court, Highfield, Southampton. (Nos. 1307 and 1310).

Peter Edward Cooke, Hastings School of Art. (No. 2136).

Frank Grimshaw, 11 St. Patrice Street (P.O. Box 329), Magog, Quebec, Canada. (No. 3469).

Miss Barbara Heath, 194 Greenvale Road, Eltham Park, S.E.9. (Nos. 1629 and 1630 [a, b, c and c]).

Miss Winifred Mary Langhorne, L.C.C. Central School of Arts and Crafts. (No. 1167).

Miss Marion Morton Philip, Skipton School of Art. (No. 2293).

Henry Kelham Smith, 16 Rutland Street, Hulme, Manchester. (No. 996).

Miss Lily Grace Stubbs, Bristol School of Art. (No. 2064).

Harold Watson, 31 Forest Road, Enfield Wash, Middlesex. (No. 2008).

The large entry for this Sub-Section is gratifying. The general improvement in the standard of work as compared with last year, both in design and practicability, is marked.

Many colour combinations left a good deal to be desired, and competitors should remember that, while their work is not judged on that basis, attractive colourings are very important in the marketing of designs.

SUB-SECTION 9. Prize offered by British Celanese, Limited, for the best single-colour design for printing Silk Fabrics for Dress Wear.

The awards are as follows :—

A Prize of £5 to Edward Francis Probert, Kershaw School of Art, Glossop. (No. 2524).

Commended :

Edward Francis Probert, Kershaw School of Art, Glossop. (No. 2527).

Miss Mary Turnbull, Croft Hey, Edenfield, Nr. Manchester. (No. 1234).

The general standard of the work submitted was noticeably lower than in Sub-Section 8. The prize was awarded to E. F. Probert's design (No. 2524) chiefly by virtue of its originality, a feature generally lacking. One other design (No. 692) would have been worthy of being highly commended but for the fact that for its execution in fabric two printing rollers would be necessary. The design, therefore, cannot be admitted as a single-colour design.

SUB-SECTION 10. Prizes offered by Messrs. F. W. Grafton and Company, Limited, for Dress Designs suitable for light Ninon Fabrics.

The awards are as follows :—

The First Prize of £15 to Miss Jean Murray, Salford School of Art, Royal Technical College. (No. 2900).

The Second Prize of £10 to Miss Kathleen Beatrice Lonsdale, Macclesfield School of Art. (No. 2690).

The Judges are disappointed with the general quality of design submitted, and would strongly recommend that careful consideration should be given to the distribution of colour in order to avoid diagonal and also horizontal and vertical effects.

SUB-SECTION 11. Prizes offered by Messrs. Simpson and Godlee, Limited, for sets of six designs suitable for printing on Cotton Dress Cloths.

The awards are as follows :—

The First Prize of Twenty-five Guineas to Miss Mary Kirby, Slade School of Drawing, Painting and Sculpture, University of London. (Nos. 1955 to 1963).

The Second Prize of Fifteen Guineas to George Cape, 78 Nelson Street, Carlisle. (Nos. 31 to 36).

The Third Prize of Ten Guineas to Miss Winifred Marion Bullough, Watford School of Art. (Nos. 2362 to 2364).

Highly Commended :

Miss Ivy A. M. Love, Manchester School of Art. (Nos. 2735 and 2736).

Miss Barbara Helen Moorhouse, Liverpool City School of Art. (No. 3226).

Commended :

Miss Florence Greenwood, Rochdale School of Art. (No. 2945).

Frank Grimshaw, 11 St. Patrice Street (P.O. Box 329), Magog, Quebec, Canada. (No. 3467).

Miss Dorothy Haigh, Watford School of Art. (No. 2368).

Miss Eva Mabel Lauder, Manchester School of Art. (No. 2733).

There is considerable merit in much of the work sent in, and, in nearly every case, the conditions of the competition have been observed. It is rather noticeable that competitors do not make the best possible use of colour, and many of the designs submitted are decidedly weak in this respect.

SUB-SECTION 12. Prizes offered by British Celanese, Limited, for the best set of six designs suitable for Men's Ties.

The awards are as follows :—

The First Prize of £10 to John Wilson, Hyde School of Art. (No. 2128).

The Second Prize of £5 to Miss Ethel Hope Lucas, 42 Milton Road, Cambridge. (No. 1406).

Highly Commended :

Leslie Victor Robinson, Macclesfield School of Art. (Nos. 2697 and 2698).

Commended :

Miss Molly Stewart Anderson, Auchengower, Cove, Dumbartonshire. (Nos. 1297 and 1298).

Miss Marjorie Gertrude Bywater, Royal College of Art. (No. 1576).

The winning design (No. 2128) by John Wilson has originality, although the colouring is crude. Miss Ethel Hope Lucas's design (No. 1406) also shows originality, but only one class of design is given. This design is very suitable for ties, handkerchiefs, pyjamas or scarves. L. V. Robinson's designs (Nos. 2697 and 2698) are a good selling line. Miss Mary Darby's design (No. 2718) is noticed as being far the best in turn-out and colouring, but the Judges cannot find in it anything original in design. For the guidance of future competitors, it may be mentioned that the Judges have not taken colouring into account if a design is good and original. A good design is more easily picked out if executed in quiet and fairly subdued colours.

The standard of the work submitted cannot be considered very high, particularly with reference to originality, several competitors appearing to have been influenced by designs already on the market.

SUB-SECTION 13. Prize offered by the Macclesfield Silk Trade Employers' Association for designs suitable for the Macclesfield trade, viz., for Materials for Ties for Men's Wear, Mufflers, Dressing Gowns and Linings for Ladies' Coats.

The awards are as follows :—

A Prize of Four Guineas to Harold Dale, Macclesfield School of Art. (Nos. 2679 and 2680).

A Prize of Three Guineas each to Leslie Holland, Macclesfield School of Art (Nos. 2685 to 2688), and Henry George Wright, Battersea Polytechnic School of Art (Nos. 2492 to 2497).

Highly Commended :

William Mellor, Macclesfield School of Art. (No. 2691).

Commended :

Eric Robert Hill, Macclesfield School of Art. (No. 2683).

The Judges were disappointed with the small number and moderate standard of the designs submitted, particularly as regards their adaptability to commercial use.

Leslie Holland's designs (Nos. 2685 to 2688) show practical knowledge and evidence of pains taken in production. Eric R. Hill's design (No. 2683) shows considerable promise and is commended.

SUB-SECTION 14. *Prizes offered by the Cretonne Department of the Calico Printers' Association for designs suitable for printed Table Covers.*

The awards are as follows :—

The First Prize of £15 to Miss Ida Marion Dight, Brackley, Crofton Lane, Orpington, Kent. (No. 1048).

The Second Prize of £10 to Miss Marjorie Iris Wilmot Hannah, Liverpool City School of Art. (No. 3182).

Highly Commended :

Miss Doris Mary Grimshaw, Hyde Bank, Romiley, Cheshire. (No. 1120).

As a whole the drawing of the designs was quite good, but there seems to be a lack of originality.

The Judges suggest that competitors should try to deviate from the common practice of making all four corners exactly alike. Also, it would be an advantage if they would put a gamut on their designs ; and make use of stipples, thus giving a better chintz effect.

SUB-SECTION 15. *Prizes offered by Messrs. Brintons, Limited, for designs for Wilton or Axminster Carpets suitable for a Theatre, Show-room or Hotel.*

The awards are as follows :

A Prize of £12 to James Hamilton, 84 Blackwell Road, Carlisle. (Nos. 571 to 573).

A Prize of £10 to John Murray McCreery, Glasgow School of Art. (No. 3423).

A Prize of £8 to Ralph Hedworth Hill, 29 McLelland Drive, Kilmarnock, Scotland. (Nos. 599 and 600).

Very Highly Commended :

Miss Frances Patricia Duncan, Kidderminster School of Art. (Nos. 2570 and 2571).

Highly Commended :

Bert Shellis, Kidderminster School of Art. (No. 2612).

Commended :

Harold Hemingway, Rochdale School of Art. (Nos. 2956, 2957 and 2958).

The designs submitted were more in number than last year and generally of a higher standard. Competitors seem to have kept in mind the limitation of the respective fabrics, whether using squared paper or not, though some would have done well to remember that curved and long straight lines which look well enough drawn in free-hand, are apt to suffer when transferred on to squares. The Judges ruled out a certain number of designs, which, though good in their way, did not contain the element of boldness which is desirable in a carpet for a theatre, show-room, or hotel. Some of the competitors accompanied their designs with sketches or photographs, showing several repeats, which were of assistance to the Judges, and probably also to the competitors themselves.

SUB-SECTION 16. *Prizes offered by Messrs. Lister and Company, Limited, for designs of modern style suitable for a Jacquard Rug. Competitors must be under 25 years of age.*

The awards are as follows :—

The First Prize of £15 to Ralph Hedworth Hill, 29 McLelland Drive, Kilmarnock, Scotland. (No. 601).

The Second Prize of £10 to William Eric Phillips, Kidderminster School of Art. (No. 2605).

Highly Commended :

Alan Stenhouse Gourley, Edinburgh College of Art. (No. 3345).

Ralph Hedworth Hill, 29 McLelland Drive, Kilmarnock, Scotland. (No. 603).

Commended :

Bert Shellis, Kidderminster School of Art. (No. 2613).

The general standard of entries was satisfactory, although a number did not comply with the condition that designs were to be of modern style. Ralph Hedworth Hill, the winner of the first prize, fully realised the possibility of obtaining an effective design by very simple means. The result was very pleasing.

SUB-SECTION 17. Prizes offered by Messrs. Lister and Company, Limited, for designs suitable for Tapestry or Moquette for Furniture Covering. Competitors must be under 25 years of age.

The awards are as follows :—

The First Prize of £20 to Miss Irene Crowther, Halifax Municipal Technical College, School of Art. (No. 2535).

The Second Prize of £10 to John Haughey, Glasgow School of Art. (No. 3433).

Highly Commended :

Frank William Evans, Kidderminster School of Art. (No. 2577).

The Judges welcome the larger number of entries, but consider that there was a lack of originality, no design being of outstanding merit. The design awarded the first prize (No. 2535) by Miss Irene Crowther, which was in modern style, was the most original. Design No. 3433, by John Haughey, though stereotyped, was a sound commercial possibility for either tapestry or damask.

There was a complete absence of any attempt to show weave effect, which is an important feature at the present time.

SUB-SECTION 18. Prizes offered by Morton Sundour Fabrics, Limited, for "Point Stitch Tapestry."

The Judges were unable to recommend that the full amount of the prizes should be given, but the following awards were made :—

A Prize of £15 to Mrs. Leonora Kathleen Green, 70 Battersea Rise, Clapham Junction, S.W.11. (No. 803).

Commended :

Miss Constance Mildred Howard, Northampton School of Arts and Crafts. (No. 2234).

Miss Mary Wallace Reddie, Edinburgh College of Art. (No. 3386).

The few designs submitted are rather disappointing, and do not show much knowledge of the purpose for which they are intended.

No first prize is awarded.

Mrs. Leonora K. Green's design (No. 803), which was awarded a prize, shows some conception of the fabric, but not very much originality. No. 2234, by Miss Constance M. Howard, shows a sense of design and is well spaced.

No. 3386, by Miss Mary W. Reddie, shows some technique, but not enough originality.

SUB-SECTION 19. Prize offered for a design for a piece of Embroidery suitable for presentation to a National Museum in memory of the late Lewis Foreman Day and his Wife.

The awards are as follows :—

A Prize of £10 to Miss Gladys Atkinson Brailsford, Battersea Polytechnic School of Art. (No. 2464).

Highly Commended :

Miss Kathleen Mary Bates, Sheffield College of Arts and Crafts. (No. 2830).

Miss Margaret Gill, Halifax Municipal Technical College School of Art. (No. 2540).

Miss Mary Talbot Sanderson, Sheffield College of Arts and Crafts. (No. 2858).

Commended :

Miss Gladys Atkinson Brailsford, Battersea Polytechnic School of Art. (No. 2465).

Miss Margaret Ithell Colquhoun, Slade School of Drawing, Painting and Sculpture, University of London. (No. 1902).

The entries for this competition were of a higher standard than those last year and also of greater originality, but at the same time there is too much reflexion of weak late Victorian design. The prize is awarded to Miss Gladys A. Brailsford for an original design of pronounced character and charm, well adapted for embroidery ; and her other design (No. 2465) is commended for its decorative facilities and its suitability for embroidery. The designs by Miss Mary Sanderson and Miss Margaret Gill are highly commended. Miss Gill's design (No. 2540) is extremely decorative, while Miss Sanderson's design (No. 2858) is excellently adapted for appliqué work. The design of acrobats by Miss Margaret Colquhoun (No. 1902) is commended. It is satisfactory to see that this competition during the last three years has shown that designs for embroidery are advancing to current ideas.

SUB-SECTION 20. Prize offered by Messrs. James Pearsall and Company, Limited, for a design for an Embroidered Afternoon Tea Cloth.

The awards are as follows :—

The Prize of £15 to Miss Winifred Rosamond Simmonds, 20 Grosvenor Road, Finchley, N.3. (No. 1774).

Highly Commended :

Miss Dora Emily Sanderson, Sheffield College of Arts and Crafts. (No. 2857).

Miss Mary Turnbull, Croft Hey, Edenfield, Nr. Manchester. (No. 1238).

Commended :

Miss Eileen Elizabeth Churm, Manchester School of Art. (No. 2717).

Miss Barbara Dacia Lack, Royal College of Art. (No. 1801).

Miss Hilda Muriel Reaney, Sheffield College of Arts and Crafts. (No. 2855).

Miss Edna Jane Shaw, Salford Royal Technical College School of Art. (No. 2917).

The prize was awarded to Miss W. R. Simmonds, because her design was new and in line with present-day thought. The awards of "highly commended" were made for the same reason. A large number of the designs were more suitable for book illustration than for needlework, others were too realistic, and others, again, showed a tendency to use too many stitches. On the whole, the Judges were disappointed with the lack of originality in design. There were, however, a few happy exceptions.

SUB-SECTION 21. Prizes offered by Messrs. A. Herbert Woolley and Company, for (a) a design for a Lace Flounce to be made in Artificial Silk and Silk and (b) a set of Laces suitable for trimming Ladies' Underclothing. Competitors must be under 24 years of age.

The awards are as follows :—

The First Prize of £15 to Miss Winifred Ethel Bexton, Nottingham Municipal School of Art. (No. 1286—Sub-Section 21 (a)).

The Second Prize of £6 to Albert Ronald Farnsworth, Nottingham Municipal School of Art. (No. 3109—Sub-Section 21 (a)).

Highly Commended :

Miss Winifred Ethel Bexton, Nottingham Municipal School of Art. (No. 3098—Sub-Section 21 (a)).

Commended :

Miss Winifred Ethel Bexton, Nottingham Municipal School of Art. (No. 1287—Sub-Section 21 (b)).

Arthur Hurman Hardstaff, Nottingham Correspondence College for Applied Designs. (Nos. 1387 and 1388—Sub-Section 21 (a)).

William Guildford Martin, Nottingham Municipal School of Art. (No. 3115—Sub-Section 21 (a)).

The number of designs submitted was not great, but the age of the competitors having been limited this year to 24, a reduction in the entry was to be expected, as it has been difficult to induce young people to come into the lace industry, which has been labouring under the menace of the withdrawal of the Safeguarding Act.

There is a gratifying amount of ability displayed in many of the designs for "A Lace Flounce," but those for "A Set of Laces" were very few, and none was considered worthy of a prize, both prizes being awarded for the flounce designs.

Some of the competitors did not appear to have sufficient regard to the heavy expense involved in the excessive amount of clipping which would be necessary in the production of their designs.

SUB-SECTION 22. *Prize offered by Sir Frederick Richmond, Bt. (Chairman of Messrs. Debenhams, Limited) for a design for a Knitted Frock.*

The Judges were unable to make any award in this Sub-Section.

SUB-SECTION 23. *Prize offered by Sir Frederick Richmond, Bt. (Chairman of Messrs. Debenhams, Limited) for a Knitted Jumper.*

The Judges were unable to recommend that the prize should be given, but made the following award :—

Commended :

Harry Barlow, Leek School of Art. (No. 2220).

The Judges did not consider that the number of entries or the quality of the designs in Sub-Sections (22) and (23) merited the award of a prize. They commended, however, H. Barlow's design (No. 2220) for the lay-out and for the suggestions for colourings attached. The designs generally were very ordinary and rather old-fashioned. There was nothing original. The Judges are of opinion that if Schools of Art would teach students more of the practical side of designing, some better results might be achieved.

(To be Continued.)

NOTES ON BOOKS.

REPORTS ON THE PROGRESS OF APPLIED CHEMISTRY. Vol. XIV—1928. London : Society of Chemical Industry. 12s. 6d. to Non-Members ; 7s. 6d. to Members.

Once more this Annual Report provides an immense collection of interesting material for those concerned with the world's chemical industries ; but it is melancholy to reflect that the signs of returning prosperity which were discernible

in last year's volume have proved for the most part somewhat illusory, and that the great majority of the trades are still encountering difficult conditions. As a result, one noticeable feature of the past year has been a great development of combinations or "mergers" affecting large undertakings, one of the most important of which was the amalgamation between the Mond Nickel Company and the International Nickel Company of Canada. These fusions have a direct and obvious relation to the general policy of rationalization, though it would be most difficult, and perhaps hardly within the scope of the Report, to form any estimate of their ultimate effect on either producers or consumers.

Before considering the question of technical progress, it may be of interest to refer to the concession which has been granted for the extraction of minerals from the Dead Sea. By the terms of this concession, the exploiting company will be required to produce annually quantities of potassium chloride increasing from 1,000 tons during the third year to 50,000 tons after ten years, and safeguarding clauses are included to prevent raising of prices or restriction of output.

As usual, technical and scientific advances have been numerous rather than fundamental, and it is no easy matter to compile a representative selection. In view both of the acute controversy engendered by the Battersea Power Station now in course of erection, and of the recent successful legal action against the Manchester Corporation, interest will certainly attach to the prevention of atmospheric pollution, in connexion with which numerous patents have been obtained. The problem involves firstly the mechanical removal of dust and grit particles, and secondly the far more difficult extraction of sulphur dioxide from the flue gases. The preliminary report of the *ad hoc* Government Committee holds out some promise that satisfactory means have been found to remove 95 % of the oxides of sulphur, but the actual functioning of the plant will be awaited with some anxiety.

Efforts to produce a satisfactory fuel by low-temperature carbonisation have been maintained, and two interesting plants have been installed at the works of the South Metropolitan Gas Company; but it probably remains true "that no process can yet be termed a commercial success except under special and favourable conditions, and that a further two years must elapse before plants now undergoing trial can show their real value."

Nitrogen-fixation has been rather definitely overdone, mainly owing to the anxiety of industrial countries to become independent of foreign supplies. The result has been an output of fertiliser considerably in excess of the total world-consumption, and this excess will almost certainly be greater still during the present year, when a large number of new plants are expected to reach production stage.

In the metallurgical industries, we find a number of new rustless steels, containing tungsten, molybdenum or tantalum, and serving "still further to confuse the unfortunate chemical engineer who is faced with the problem of choosing between these materials." Research on chromium plating has been active, partly on the question of providing a satisfactory preliminary substratum of other metal (e.g., nickel, copper, silver, gold), and partly on the elimination of the highly toxic chromic acid fumes which are evolved during the deposition. Beryllium, which is said by geologists to be quite as abundant in the earth's crust as either lead or zinc, and which has many valuable properties, will probably soon assume some engineering importance, by reason of the advances recently made in the processes for its extraction. Finally, it is satisfactory to hear that South Africa will almost certainly become one of the most important of the world's producers of platinum during the next few years.

The struggle between cane and beet sugar continues, but the present conclusion seems to be that cane sugar has gained a predominating position which it is not likely

to lose. The advent of the new cane, P.O.J. 2878, has given some concern to the beet growers. The yield of roots per acre obtained by the latter continues at a disappointingly low level, and it is obvious that a considerable improvement must be effected in this direction if the home industry is to become capable of standing without Government support.

The situation in the leather trade has not been altogether happy. The high prices of 1927 and early 1928 led to rubber substitutes for sole leather, and many boot and shoe manufacturers continue to employ these. Definite attempts are now being made to convince the customer that there is "nothing like leather," but it would be rash to predict the outcome.

An item of exceptional interest relates to the chlorination of water supplies. The twenty-third Annual Report of the Metropolitan Water Board states that about two million people have been supplied with chlorinated water since May 1916, without any complaints as regards taste. But other undertakings have had trouble, which is now being traced partly to willows, poplars and meadowsweet growing by the sources of supply; it appears that these yield products which on chlorination give to the water a taste resembling that of iodoform. The chlorination of water in swimming-baths, necessitated by the unfortunate fact that "swimmers present a large and far from sterile surface," is the subject of a special report by the Ministry of Health. It is stated that by judicious treatment the water in the baths can be kept so transparent that "the smallest object can be discerned on the bottom at the deep end, and any bather in difficulties can be seen."

Lastly, it may be thought worth while to describe two thermodynamical curiosities. One is a heat engine in which the "working substance" is mercury instead of water. It is well known, of course, that mercury would have a theoretical advantage in efficiency over water, but it now appears that a 10,000 k.w. mercury-vapour turbine has actually been installed in America, and is found to function economically. The other invention proposes, in regions where the air temperature is in the neighbourhood of -40° deg., to pump water at almost 0° deg. from beneath thick layers of ice and utilise its latent heat of fusion to work a heat engine. This again looks quite sound from the theoretical point of view, though certain obvious economic objections present themselves.

TOURING LONDON. By W. Teignmouth Shore. London: B. T. Batsford. 4s.
LITTLE KNOWN ENGLAND. By H. Eberlein. London: B. T. Batsford. 12s. 6d.

The second of these books begins with the words: "London, of course, is the least known part of all England." Well, if this is so, it is not for lack of efforts on the part of natives and foreigners alike to map out the metropolis on an elaborate scale; Mr. Shore's book appears at the same time as one called *London: was nicht im Baedeker steht*, by one of the editors of *Querschnitt*, and soon we are getting another, with descriptions and drawings by Mr. Gaunt of the *Studio*. One anticipates that the last named author will give us our perennial types up-to-date, grown out of their Phil May clothes: our street entertainers, our 'bus conductors, and those ladies in solid grill-rooms who are as thoughtful for their regular customers "as a dead aunt."

Mr. Wedderkop of *Querschnitt* is more topical; he makes generalisations, it is true, but seems most anxious to skim the cream from our London of to-day; and cream, as someone using this metaphor must surely have observed before now, lies on the surface. At the same time his book is fun, and his comments on cricket are from the heart. He would appreciate an episode I happened on last week. A desultory, ever so amateurish cricket match was going on by Chelsea Hospital.

One long line of undutiful tradesmen with their vans circled the ground. At last the peace was broken by an ice-cream boy—"Wake up England!"

Mr. Shore is on the orthodox side; very creditably, he is not afraid of being a bore with his facts, and so we all learn something from him. His attitude of respect for the past is not too conventional; he is not less sincere about Thackeray than Mr. Wedderkop about Mr. Osbert Sitwell. The illustrations are a little miscellaneous, but what a good idea it was to number among them Messrs. Fribourg and Treyer's shop-front in the Haymarket. For this piece of conservatism the firm deserves the patronage of all the hosts of advanced democrats from America that annually invade us.

Mr. Eberlein's book is altogether attractively produced, and is very well illustrated; there is also a pleasant dust jacket by Albert Rutherston in his characteristic manner. Mr. Eberlein is a widely travelled man, able to make comparisons and appreciate both standard values and adventitious charms. His "little known England" is an area which "curiously enough, forms approximately a U-shaped strip across the face of the country": Welsh Borderland, Cotswolds, Chilterns and East Anglia. The "curiously enough" is a puzzle; perhaps the U stands for Unspoilt?

Little known England, in the warmer months at any rate, offers every lure to the town-weary except good food. I do not add "and wine," because there is plenty of good beer and cider.

GENERAL NOTE

"SAVE THE COUNTRYSIDE" EXHIBITIONS.—The original "Save the Countryside" Exhibition was collected for the Leicester National Conference to show the desecration of the countryside by blatant advertisements, ugly garages, unsuitable building, road-widening, litter, etc., and how this could be avoided. The Exhibitions have visited London, Manchester, Edinburgh, Liverpool, etc., and the publicity received led to such a demand that the Council for the Preservation of Rural England (to whom it was handed over) have arranged four exhibitions of different sizes which are available for loan to responsible groups anxious to help the movement. Each Exhibition illustrates the problem of unsightly advertisement, with some suggestions as to remedy; the garage and petrol station, tidy and untidy; examples of housing, suitable and unsuitable, which are in accord with, or destroy, the amenities of the countryside. Then there are examples of bridges and bridge repair, road widening good and bad, cottage building, shop-fronts, inns, litter and how to avoid it, examples of the work of various societies helping to preserve the countryside, such as the National Trust, Commons and Footpaths Preservation Society, Scapa Society, Society for the Protection of Ancient Buildings, Surrey Photographic Survey, protection of wild flowers, wild birds, bird sanctuaries, and, finally, examples of suitable and unsuitable arrangement of graveyards and gravestones. The Exhibitions are lent on condition that the borrowers pay carriage both ways and give a contribution towards the funds of the C.P.R.E. Exhibition Committee of £1 1s. to £5 5s.

MEETINGS OF OTHER SOCIETIES DURING THE ENSUING WEEK

MONDAY, OCTOBER 6. Engineers, Society of, at Burlington House, W. 5.30 p.m. Lt.-Col. H. C. Hawkins, "Some Impressions of America."

Iron and Steel Institute, at the Cleveland Technical Institution, Middlesbrough. 7.30 p.m. (1) Mr. H. C. Wood, "Open-Hearth Furnace Steelworks—a Comparison of British and Continental Installations and Practice." (2) Mr. J. Sarek, "What Reasons compelled the Prague Ironworks to introduce thin-walled Blast Furnaces?" (3) Mr. A. Kriz, "The Heterogeneity of an Ingot made by the Harnet Process." (4) Mr. L. W. Schuster, "The Effect of Contamination by Nitrogen on the Structure of Electric Welds." (5) Mr. O. Quadrat, "A Contribution on the Problem of the Analysis of Basic Slags and the Representation of their Composition in a Triangular Diagram."

Public Health, Royal Institute of, 37 Russell Square, W.C. 4 p.m. Prof. Dr. W. H. Park, "Pneumonia. Lecture I: The Types of Pneumococci in Adults and Children and their Significance."

University of London, at University College, Gower Street, W.C. 2.30 p.m. Prof. Sir F. Petrie, "Egyptian History before the 18th Century."

TUESDAY, OCTOBER 7. Automobile Engineers, Institution of, at the ROYAL SOCIETY OF ARTS, Adelphi, W.C. 8 p.m. Sir Herbert Austin, Presidential Address, "The Future Trend of Automobile Design."

Heating and Ventilating Engineers, Institution of, at 20 Hart Street, Bloomsbury, W.C. 7 p.m. Mr. G. L. Copping, "Power Plant Chimney Pollution."

Iron and Steel Institute, at the Secondary Schools, Scunthorpe. 7 p.m. (1) Mr. H. C. Wood, "Open-Hearth Furnace Steelworks—a Comparison of British and Continental Installations and Practice." (2) Mr. F. Bainbridge, "Developments in Fuel Economy at Skinningrove." (3) Mr. J. A. Jones, "Chromium-Scupper Structural Steels."

At the Metallurgical Club, Sheffield. 7.30 p.m. (1) Mr. D. F. Campbell, "High-Frequency Steel Furnaces." (2) Mr. W. H. Hatfield, "Permanence of Dimensions under Stress at Elevated Temperatures." (3) Mr. A. Kriz, "The Heterogeneity of an Ingot made by the Harnet Process." (4) Mr. H. C. Wood, "Open-Hearth Furnace Steelworks—a Comparison of British and Continental Installations and Practice."

Metals, Institute of, at the Chamber of Commerce, Birmingham. 7 p.m. Address by Mr. T. G. Bamford, Chairman of the Birmingham Section.

Public Health, Royal Institute of, 37 Russell Square, W.C. 4 p.m. Prof. Dr. W. H. Park, "Pneumonia. Lecture II: The Epidemiology. The Rebuling of Antipneumococcus Serum."

University of London, at King's College, Strand, W.C. 4 p.m. Dr. J. W. Pickering, "Blood Plasma and Platelets." (Lecture I.)

At King's College, Strand, W.C. 5.30 p.m. Prof. Sir B. Pares, "Contemporary Russia. Lecture I—The Reign of Nicholas I."

WEDNESDAY, OCTOBER 8. Automobile Engineers, Institution of, at the Metropole Hotel, Leeds. 7.15 p.m. Sir Herbert Austin, Presidential Address, "The Future Trend of Automobile Design."

Central Asian Society, at 74 Grosvenor Street, W. 8.30 p.m. Mrs. Drower (E. S. Stevens), "The Folklore of Iraq."

Chemical Engineers, Institution of, at Burlington House, W. 8 p.m. Dr. Saral J. Kohli, "The Effect of Surface Conditions on Heat Transmission."

Eugenics Society, at Burlington House, W. 8.30 p.m. Discussion on "Quinquennial Health Assessments." Speakers: Dr. E. B. Turner and others.

Illuminating Engineering Society, at 15 Savoy Street, Strand, W.C. 6.30 p.m. Report on Progress in Illuminating Engineering prepared by Technical Committee.

Public Health, Royal Institute of, 37 Russell Square, W.C. 4 p.m. Prof. Dr. W. H. Park, "Pneumonia—Lecture II—"The Therapeutic Use of Vaccines and Antibacterial Sera."

Television Society, at University College, Gower Street, W.C. 7 p.m. Mr. J. H. O. Harries, "Some Developments in Television Based on Quantitative Analysis."

University of London, at King's College, Strand, W.C. 5.30 p.m. Rev. F. R. Barry, "Professions and Careers. Lecture I: The Ministry of the Church."

At the London School of Economics, Aldwych, W.C. 6 p.m. Lecture on "Office Machinery" (1).

At the London School of Economics, Aldwych, W.C. 6.30 p.m. Miss M. S. West, "The Literary and Historical Study of the Old Testament."

THURSDAY, OCTOBER 9. Aeronautical Society, at the ROYAL SOCIETY OF ARTS, Adelphi, W.C. 6.30 p.m. Mr. C. R. Fairey, Presidential Address on "The Growth of Aviation."

Asiatic Society, 74 Grosvenor Street, W. 4.30 p.m. Miss Mar. Luusden, "Yunnan."

Egypt Exploration Society, at Burlington House, W. 5 p.m. Prof. F. L. Griffith, "Christianity in Nubia."

Marine Engineers, Institute of, 88/88 The Minories, E.C. 7 p.m. Mr. W. Lambert, "The Manufacture of Propellers."

Metals, Institute of, at 81 Pall Mall, S.W. 7.30 p.m. Address by Mr. W. T. Griffiths, Chairman of the London Local Section.

University of London, at Bedford College for Women, Regent's Park, N.W. 11 a.m. Prof. L. Abercrombie, "Shakespear."

At Bedford College for Women, Regent's Park, N.W. 2 p.m. Prof. Wilson, "General Physics."

At Bedford College for Women, Regent's Park, N.W. 1.30 p.m. Prof. Eccles, "La Littérature et la Société françaises sous Louis XIV."

At Goldsmith's College, New Cross, S.E. 8 p.m. Eng. Vice-Admiral Sir G. Goodwin, "Engineering Economics."

At King's College Strand, W.C. 5.15 p.m. Rev. N. Sykes, "Social and Political Ideas of some Representative Thinkers of the Age of Reaction and Reconstruction." (Lecture I.)

5.30 p.m. Mr. H. W. Stead, "The Suicide of Austria-Hungary, 1908-1914. Lecture II—Austro-German Relations."

At University College, Gower Street, W.C. 5 p.m. Mr. P. Hopkins, "A Psycho-Analytic Study of Jeremy Bentham as a Type of Social Reformer."

5.30 p.m. Mr. R. Engelbach, "Recent Discoveries in Egypt."

5.30 p.m. Prof. H. Spemann, "Introduction to the Theory and Practice of Experimental Embryology." (Lecture I.)

FRIDAY, OCTOBER 10. Iron and Steel Institute, at the Royal Metal Exchange, Swansea. 7 p.m. (1) Mr. A. Kriz, "The Heterogeneity of an Ingot made by the Harnet Process." (2) Mr. H. C. Wood, "Open-Hearth Furnace Steelworks—a Comparison of British and Continental Installations and Practice." (3) Mr. O. Quadrat, "A Contribution on the Problem of the Analysis of Basic Slags and the Representation of their Composition in a Triangular Diagram."

Metals, Institute of, at the Applied Science Department, University of Sheffield. 7.30 p.m. Conjoint Meeting for the Sixth "Sorby" Lecture.

University of London, at King's College, Strand, W.C. 5.30 p.m. Mr. H. Jenkinson, "Handwriting of the English Business Man from the 12th Century to the 19th."

At University College, Gower Street, W.C. 5.30 p.m. Prof. H. Spemann, "Introduction to the Theory and Practice of Experimental Embryology." (Lecture II.)

SATURDAY, OCTOBER 11. L.C.C. Horniman Museum, Forest Hill, S.E.23. 3.30 p.m. Dr. W. G. Ivens, "Native Life in the Solomon Islands."

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No. 4064

FRIDAY, OCTOBER 10th, 1930

VOL. LXXVIII

*All Communications for the Society should be addressed to the Secretary, John Street,
Adelphi, W.C.2.*

NOTES OF THE WEEK

"The future lies in the social integration. The social integration rests on organisation. And in this organisation the seat of efficiency and the centre of all power in the future is in that cultural heredity which civilisation imposes on the individual through the emotion of the ideal. There is practically nothing which cannot be accomplished through the emotion of the ideal in civilisation. There is absolutely no aim, which civilisation chooses to set before itself, which is not possible for civilisation to achieve, even to the sweeping away of this existing world and the creation of a new world in a brief space of time. The great question of the age, the question to which all others is subordinate is : Where are we to look in the new order for the psychic centre of this cultural heredity of civilisation ? "

Benjamin Kidd.

Lincoln.—We see that Mr. Arthur E. Appleyard, a native of Lincoln, but now a wealthy resident of Minneapolis, has expressed a desire to give £10,000 to his native City, but proposes to leave the decision as to how this is to be spent until he again visits Lincoln. Meantime, the City Council are considering proposals to put before him. We hope he will consider the preservation of the fine 18th century church condemned for reasons similar to those advanced in connection with High Wycombe; and also the purchase of The Jew's House on the Hill of Lincoln, reputed to be the oldest inhabited house in England, the condition of which does not do credit to the beautiful city of Lincoln.

Keats's House.—We are glad to see that there is some hesitancy in proceeding with the original plans for additions to this characteristic late-Georgian house, with its Victorian drawing-room additions. It is now suggested that the latter might be pulled down. May we suggest to Alderman W. P. Newman and

Alderman F. G. Howard that it might be well to call a halt to all these proposals, and get together a few of the Memorial Committee and other well-known Hampstead residents interested in literature, and ascertain their views as to how best to secure the additional accommodation required for housing the Dilke bequest with the least change in the atmosphere of the period associated with Keats? Surely, the matter is of more than local interest, and a little delay, in order to be sure the right thing was being done, would be appreciated by lovers of Keats everywhere.

Advertising.—The power of advertising in the development of modern industry was referred to by the Lord Mayor of London when opening the Third Annual Exhibition of Advertisements in London :

“ Advertising is rapidly gaining wider recognition as a very important factor in the furtherance of trade. The power wielded by newspapers and periodicals, through the columns of which it is possible to address millions daily, is enormous.

“ Vast problems lie before us as a nation. We have to find markets for our manufactures and employment for our people. There is no room for pessimism.

“ It is our hope that you who are actively engaged in this great business of advertising will bring all your resolution to bear on the important task of quickening the imagination and enterprise of our business men : pointing the way to new markets, and worthily developing the nation's industries.”

The readers of this *Journal* will recognise how definitely the Lord Mayor has endorsed the views, so frequently expressed here, in regard to advertising. We are sure, however, that Sir William Waterlow realises that there is a very great deal of advertising, the purpose of which is not to “ quicken the imagination ” but to shock the susceptibilities of the observer, and that it should not be necessary, in an enlightened business community, to call attention to the destruction of rural and urban seemliness by advertising which is offensive instead of pleasing to the eye. We are very glad to be reminded that it is the duty of the business man to quicken the imagination, but we would urge him to see that such quickening is not associated with unseemly hoardings and bill-sticking on buildings which so many societies are seeking to protect.

Walking along Piccadilly the other night we were astonished at the increasing and bewildering pyrotechnic effects on most of the buildings in and around the Circus and Leicester Square. There were, however, certain buildings entirely free from any form of advertising, notably those forming the architectural continuation of the new Regent Street. We hope this is an indication that as and when the rebuilding of Piccadilly Circus is complete, it will cease to be the sport of the advertiser. Are there any regulations controlling the new architecture of the Circus, or is it simply that the more seemly and ordered architecture suggests that any interruption of its lines would be unsuitable? We noticed with interest in Leicester Square that Messrs. Stagg & Mantle, who have recently

remodelled their front into very pleasant lines, have no advertisements thereon at all, although the new Empire has hidden its new architectural front with huge advertisements.

We know, of course, that the reply is that most of the advertisements are on buildings housing many tenants, who no doubt make a considerable revenue from these advertisements. But surely it is time, in the interest of the dignity of the Advertisers' Association, that some control should be exercised in regard to this most important centre of the West End of London.

We are glad to see that our Dominion visitors are impressed by the beauty of the Mall, and seem to think that it is one of the finest Avenues in Europe. It is certainly the most English in its seemliness, and surely owes its beauty and dignity in its general uniformity of material and the scale of its buildings.

Historic Buildings.—We hope the proposed Bill to stop the export of old buildings will be more successful than the Government's Rural Amenities Bill, which would have given powers to local authorities to remove all unsightly hoardings and advertisements in or near beautiful villages or any historic buildings. The initiation of the new Bill seems to be due in some measure to the controversy as to Hadrian's Wall, with which we gather that the National Trust have now effectively dealt. It will be remembered that the matter of Hadrian's Wall was referred to in these notes some months ago. The object of the Bill is to deal with the question of the removal of historic buildings. In this connection, it would be very interesting to make a list of all buildings which have actually been removed from their setting. We believe this list would prove to be very short. There have been a number of scares about interesting buildings being taken away to America, but, on enquiry, it has often been found that they have been bought for the purpose of re-using the materials for the restoration of, or addition to, other buildings in England. A considerable list could be made of this use of old buildings. It has been pointed out over and over again that directly an old building is moved from its environment it ceases to have any value as such, and becomes simply so much beautiful old material. The loss to the locality by the removal of such buildings is irreparable. There has, of course, been a very considerable depletion of the decorative features, such as, fine panelling and staircases, not to speak of priceless furniture and pictures, and America has gained enormously by the purchase of these. Americans have had every encouragement to make these purchases after their removal, and cannot, therefore, very well be blamed. We fear it will be difficult to frame a Bill which will restrict the removal of the structure and all the manifold details which are so much a part of their charm. The application of the Ancient Monuments Act to inhabited houses of historic value would seem to meet the case. Will the Government be up against "the Englishman and his castle"?

Regent's Park and Carlton House Terrace.—As long as we can remember the stucco fronts of Nash's terrace houses in Regent's Park have been duly repainted every so many years a particularly pleasant stone colour, which was very characteristic of London, and went so delightfully with its familiar plane trees. Many will, we are sure, regret the change in the colour which has been made this year. Surely it is too strong, and will not assimilate the smoke of London anything like so successfully. We wonder what the reason for the change is. We thought at first it was only an undercoating for the old familiar colour.

Art Galleries.

JOHN NASH, oil paintings and water colours. *Goupil Gallery.*

The Goupil Gallery must be congratulated on their excellent arrangement of a delightful exhibition. In the small gallery, John Nash's flower drawings and water colour landscapes are an exquisite prelude to the brilliant fugue of his oil paintings in the large gallery.

Mr. Nash is a joyous painter; his water colour *Trees in Sunlight* (8) is calmly light-hearted, and in his prosaically labelled "Botanical Drawings," he has painted the scent of the flowers, as well as each stamen. In his recent work, Mr. Nash has adhered more closely to the classic form, and he can no longer be associated with any "school" of painting, but it is, and has always been, in this capacity for catching the very essence of his subject that his magic lies. The *Canal Bridge, Bath* (53), can be nowhere else but Bath. It is not necessary to recognise the bridge and buildings; the spirit of Bath is there and is unmistakable.

Allied to this feeling for the essence of his subject, is Mr. Nash's sense of the seasons. His landscapes do not lie in a glass case out of which the air has been pumped; each is alive in a particular season, a particular hour or minute, a particular condition of the weather, and this satisfying realism of atmosphere and feeling is the more remarkable in that it is invariably accompanied by beautiful colour and definite decorative value. In *Still Life* (43), a flower painting, in which a large number of colours combine in perfect harmony, his unerring and subtle colour taste is especially evident, but it is equally present in every one of his pictures, and in many, *Three Carts* (38), for example, it adds definite value.

It is surprising to find, in the catalogue, that the pictures are so comparatively low in price.

(1). C. R. W. NEVINSON, paintings, etching and lithographs.

(2). ALAN DURST, sculpture.

Leicester Galleries.

C. R. L. Nevinson cannot be said to belong to any school of painting, but he owes allegiance to so many schools, that it is difficult to realise that his exhibition, which opened at the Leicester Galleries last Monday, is a "one man show."

It is not necessarily disparaging to say that *Cagnes* (49) is painted in the manner

of Cezanne, that 62 follows the futurist school, nor even perhaps that *A Cornish Sea* (69) is reminiscent of the pictures of rough seas on craggy coasts so often to be seen on the walls of seaside apartment houses, but among this variety of styles it is not only difficult to find the real Mr. Nevinson, but it is equally difficult to find a real sincerity.

In Mr. Nevinson's pictures one finds shapes that look like people and tones that look like sunshine, but only in the way that a cloud may look like a camel and only too often, in Mr. Nevinson's case, the cloud itself turns out to be cotton wool. *Antibes* (47) is a picture of shapes like people and tones like sunshine, but the shapes and tones have no more the fundamental qualities of people and sunlight than a cloud can have the fundamental qualities of a camel, and it is not satisfactory enough in pattern and colour to be an adequate picture of shapes and tones. Mr. Nevinson's colour is heavy, often crude, and sometimes sets up a definitely jarring note, as in the red, white and blue of the flag in *Les Bibliophiles* (66).

There is also at the Leicester Galleries, an exhibition of sculpture by Alan Durst, which is, on the whole, trite and banal, though the *Horse* (4) and *Feline* (1) are not displeasing.

Drama.

"THE PASSING OF THE ESSENES," BY GEORGE MOORE, ARTS THEATRE CLUB.—The publication of a book or the production of a play by George Moore is always a notable event, and the production of the "Passing of the Essenes," at the Arts Theatre Club is more than usually interesting because it is bound to revive the controversy aroused by the publication of "The Brook Kerith." The play is based on a situation that occurs towards the end of the book, and the sincere and delicate handling of the theme and beautiful flowing quality of the dialogue more than compensate for certain technical imperfections it has as a play.

It is very rarely that such exquisitely written English is spoken on the stage, and equally rarely that it is as beautifully spoken as in this production. Mr. Robert Atkins, the producer, and all the members of the cast, show an understanding of the author's ideas in a way that makes the production a perfect whole.

The fine performances of Mr. John Laurie as Paul of Tarsus, Mr. Neil Porter as Mathias, Mr. John H. Moore as Saddoc and Mr. H. R. Hignett as Hazael, the patriarch of the Essenes, must be specially mentioned, but all the acting is sincere and sensitive. The tempo, lighting and grouping are perfect.

Members of the Arts Theatre Club and their guests who have been unable to obtain seats for this production, will have another opportunity of seeing the play as additional performances are to be given in a few weeks' time.

NOTICES

OPENING OF THE 177th SESSION

The programme of Meetings for the forthcoming Session is now in the course of preparation and the Prospectus will be issued to Fellows during the last week in October. The opening meeting of the session will be held at 8.30 p.m. on Wednesday, November 5th, when the Inaugural Address will be delivered by SIR EDWARD GAIT, K.C.S.I., C.I.E., Chairman of the Council. The subject of the Address will be "Britain's Record in India."

After the delivery of the Address, the Society's silver medals awarded for papers read last session will be presented.

COMPETITION OF INDUSTRIAL DESIGNS

SPECIAL COMPETITION FOR DESIGNS IN BEATL

A special section of the Society's Competition of Industrial Designs will be held in November next. Three first prizes of £100 each, three second prizes of £50 each, and three third prizes of £25 each, will be offered for designs for articles to be manufactured in Beatl Ware. The competition is divided into three sub-sections: (a) Designs for Door Furniture, Electric Lighting Parts, and Bell Pushes; (b) Designs for Lavatory and Bathroom Equipment; and (c) Designs for New Uses for Beatl.

The competition is open to all, and in view of the substantial prizes and the novelty of the subjects, it is hoped that the number of candidates will be large.

Particulars of the competition can now be obtained on application to the Secretary, Royal Society of Arts, John Street, Adelphi, W.C.2.

REPORT ON THE COMPETITION OF INDUSTRIAL DESIGNS, 1930

(Continued)

SECTION III.—FURNITURE

SUB-SECTION 1. *Prize offered by the Royal Society of Arts for Designs for the complete furnishing and decoration of a Dining Room in a small modern suburban house.*

The awards are as follows:—

The Prize of £25 was equally divided and a Prize of £12 10s. 0d. each was awarded to:—

Arthur Edward Harvey, A.R.C.A., 7 Southdown Avenue, South Road, Handsworth, Birmingham. (Nos. 555 and 556) and

Thomas Tunstall Hewitson, Liverpool University School of Architecture. (Nos. 563 and 564).

Highly Commended:

William Lewis Havard, Corsock, Stanley Avenue, Wembley, Middlesex. (Nos. 1371 to 1377).

Commended :

Harold John William Hyde, Croxbottom Cottage, Newton St. Loe, Nr. Bristol.
(Nos. 133 and 134).

William Henry Russell, c/o Stanley, Leamington Road, Broadway, Worcs.
(Nos. 3042 and 3043).

This Sub-Section attracted a great number of entries. It is evident that the condition stating that the character of the work must be entirely modern has caused competitors considerable difficulty. The rigid simplicity and plain surfaces which characterise much of the best modern work may, in unskilful hands, be employed in such a manner that either dullness or banality is inevitable. Where both furniture and wall spaces are plain the effect must be largely obtained by the skilful use of colour, and the majority of the schemes submitted were undistinguished in this regard. The Judges were interested in the drawings submitted by William Lewis Havard (No. 1376). This competitor has undoubtedly been influenced by Le Corbusier, but it is unthinkable that such furniture and decoration would be installed in a small modern suburban house such as is specified in the conditions. Although furniture of this kind appears simple it is in fact costly, and would be beyond the means of a householder with an income not exceeding £500 a year. The Prize, after much consideration, was divided between Arthur Edward Harvey (No. 555) and Thomas Tunstall Hewitson (No. 563). These competitors have submitted schemes within the terms laid down, and furniture and decoration were characterised by simplicity and good taste.

Harold John William Hyde, of Bristol, submits a very good set of drawings (No. 133), but his modernity does not extend beyond the kind of thing which was being done about 1900. Had he left out the rather patchy decoration and refrained from fitting a clock face into a book-case his name would, in all probability, have been bracketed with the two mentioned above, and the prize would have been divided into three. His colour scheme was very pleasant. William Henry Russell (No. 3042), while failing to present his ideas in an attractive way, submits furniture and fittings for a dining room which would more likely be acquired by the owner of a small modern suburban house than many of the others. The proportions are nice, and if he will make a study of colour and cease to regard simplicity as a fetish he will doubtless do more interesting work in the future.

SUB-SECTION 2. Prize offered by the London Cabinet and Upholstery Trades Federation for Designs for a Modern Lounge, the subject being : " A man has £200 to spend and wants to fit up a Modern Lounge measuring 18ft. x 14ft. in his house. What would you suggest, including furniture and furnishings (carpets, curtains, etc.) ? "

The award is as follows :—

The Prize of £25 to William Lewis Havard, Corsock, Stanley Avenue, Wembley, Middlesex. (Nos. 1378 to 1381).

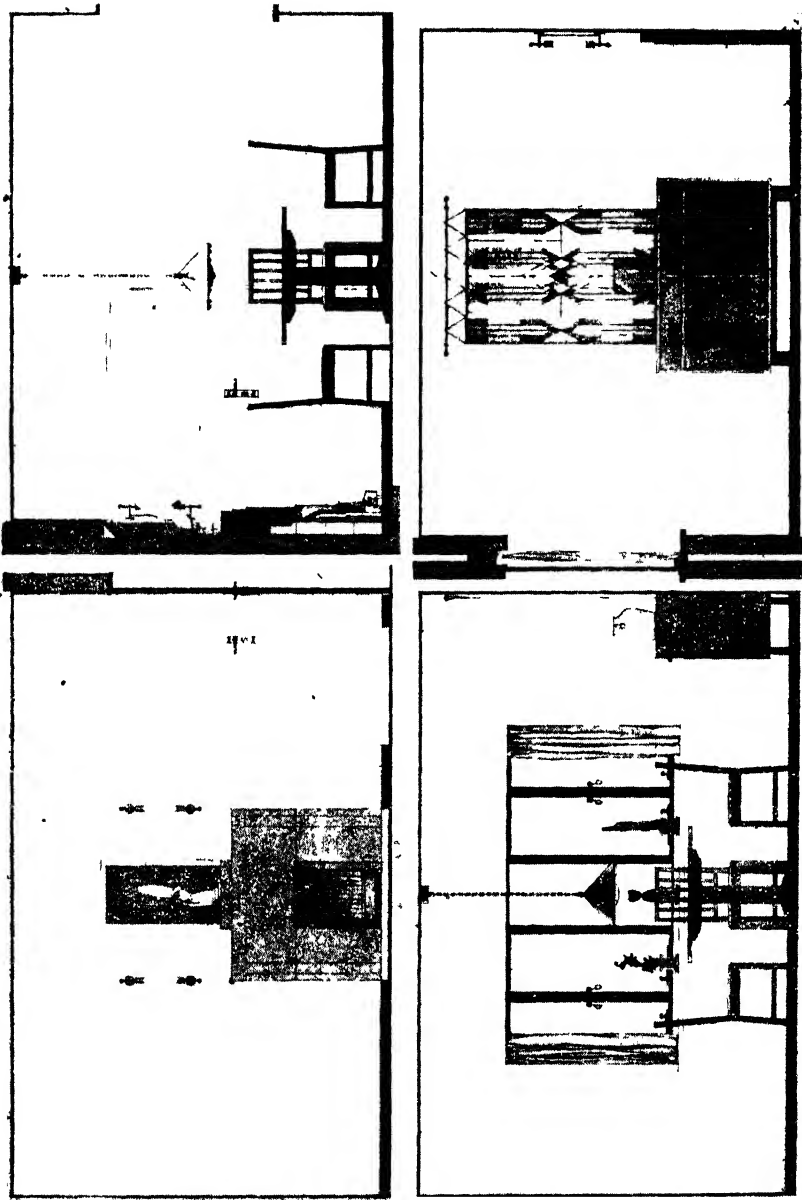
It is regrettable that so few designs have been submitted and that the quality is so poor.

Out of the ten exhibitors only one shows any real appreciation of the subject and only two others have been selected for exhibition.

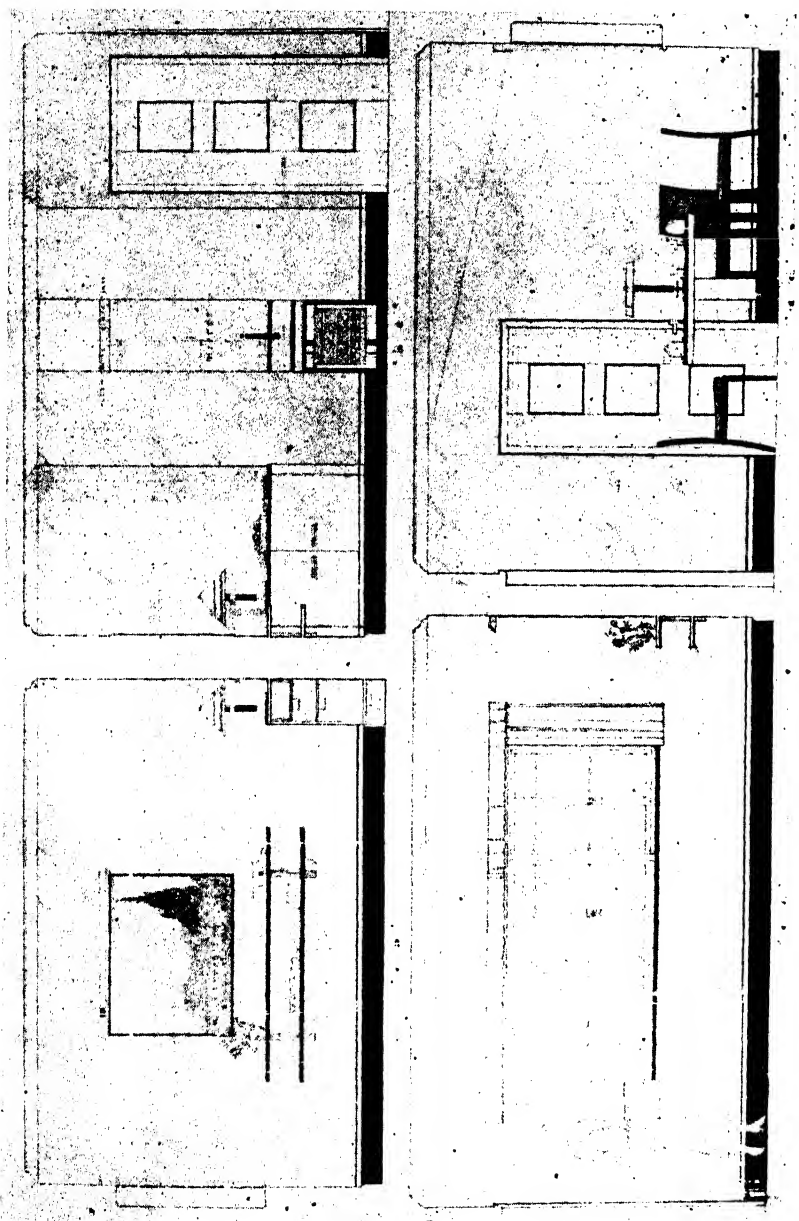
The Prize of £25 has been awarded to W. L. Havard for designs Nos. 1378 to 1381, as these drawings carry out the conditions of the competition ; they are modern in treatment, serviceable in arrangement and quite practical as regards construction.

The drawing is very good but the colour scheme rather too crude.

With regard to the two designs selected for exhibition, Nos. 2202 and 2203 by



Furniture Sub-Section 1. Mr. Arthur E. Harvey Design No 555
 Reproduced by kind permission of the Editor of *The Cabinet Maker*



* Furniture. Sub-Section 1. Mr. T. T. Hewitson. Design No. 563.
* Reproduced by kind permission of the Editor of *The Cabinet Maker*.

Sidney Lord show considerable skill in the drawing of the furniture, though little originality ; the perspective drawing is poor.

Nos. 464 and 465 by Arthur Wise, show originality but are rather fantastic and the furniture far too massive and heavy. This competitor shows artistic feeling in his drawings, but they are much too sketchy.



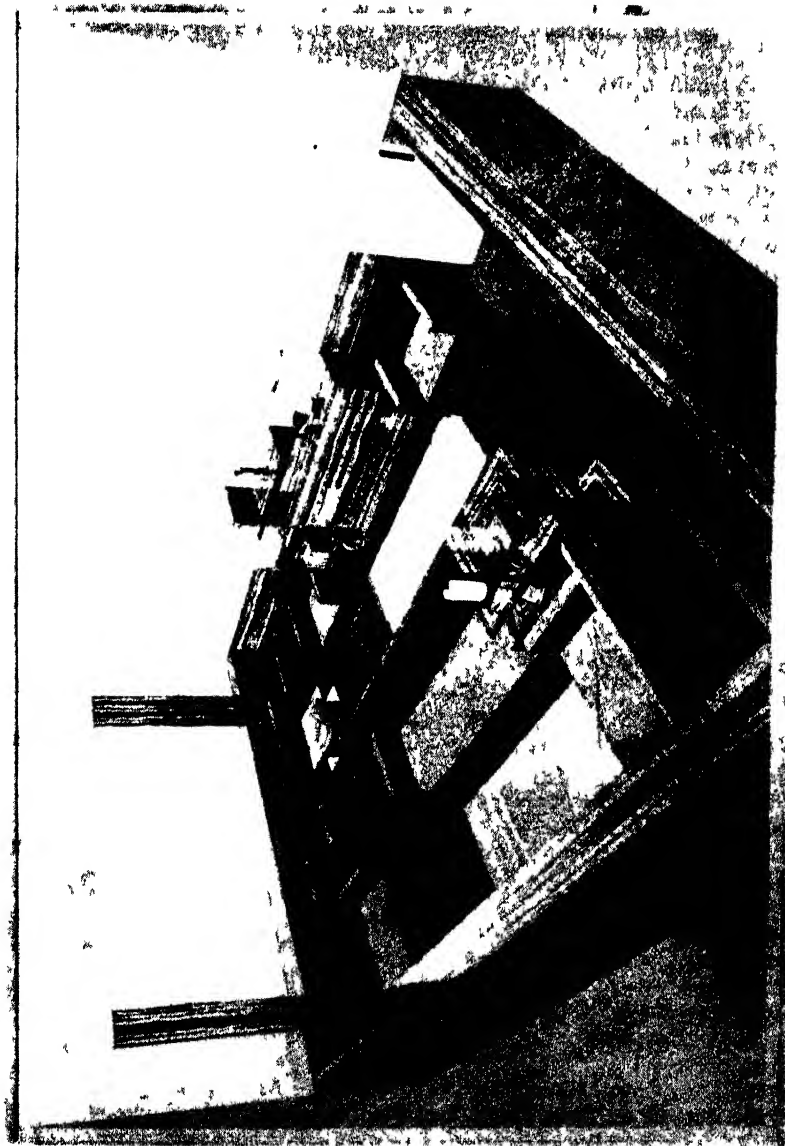
* Furniture Sub Section 3. Mr I W McCall Design No 190.

SUB-SECTION 3 Prize offered by the Peninsular and Oriental Steam Navigation Company for a Design for the furniture of a First Class Saloon Single-Berth Cabin suitable for a vessel trading to the Far East

The awards are as follows -

The Prize Two Tickets of the value of 20 guineas each on any P & O. fortnight's Summer Cruise together with 10 guineas in cash to cover expenses ashore during the tour to Frank William McCall, c/o Gordon, 25 Spottiswood Road Edinburgh (Nos 189 and 190)

* Reproduced by kind permission of the Editor of *The Cabinet Maker*



* Furniture Sub Section 2 Mr W I Havard Design No 1381

* Reproduced by kind permission of the Editor of *The Cabinet Maker*

Highly Commended :

Sydney Hugh Piggott, 10 The Ridgeway, Old Southgate, N.14. (Nos. 1707 and 1708).

Commended :

Leonard Spencer Dixon, 7 Broadway Market, Southend-on-Sea, Essex. (No. 1616).

Norman Holmes, 465 Brunshaw Road, Burnley. (No. 1385).

The Prize is awarded to Frank W. McCall (Nos. 189 and 190) for simplicity of design, clean drawing, some original features in fittings and restful colour. These qualities are absent in designs of many of the other competitors.

The prizewinner shows considerable originality in the fitting up of the cabin, and although he would possibly have to modify certain features with a view to working in with ship construction, generally there is very little to find fault with. The panelling of the bulkheading is simple and the method of lighting the cabin has certain novel features. This is especially noticeable in the arrangement of lighting over the berth.

The arrangement of wardrobes and internal fittings is good, and in the space allotted the maximum amount of stowage space for clothes has been utilised without in any way giving the cabin a cramped appearance. The colouring is restful and the drawing very good.

Although some of the remaining designs have good features, they are considered unsuitable for ship work.

SECTION IV.—BOOK PRODUCTION

SUB-SECTION 1. *A Title-page set from type with or without printers' ornaments. The books prescribed in each Sub-Section were "A Child's Garden of Verses" (8½" x 6") and "Tobit" (6½" x 4½").*

The awards are as follows :—

A Prize of Three Guineas to Charles Ernest Phillips, 2038 West 45th Avenue, Vancouver, Canada. (No. 216).

A Prize of Two Guineas to Robert William White, London School of Printing. (No. 2046).

A Prize of One Guinea each to George Henry Dominy, London School of Printing. (No. 523); and

Charles Ernest Phillips, 2038 West 45th Avenue, Vancouver, Canada. (No. 215).

Highly Commended :

George Henry Dominy, London School of Printing. (No. 522).

Reginald Ernest Frederick Harwood, London School of Printing. (Nos. 2051 and 2053).

Charles Ernest Phillips, 2038 West 45th Avenue, Vancouver, Canada. (No. 214).

Robert William White, London School of Printing. (No. 2048).

Commended :

David Kennard, 41 Windsor Street, Rugby. (No. 2250).

Edward Joseph Anthony Lamb, 84 Lawford Road, Rugby. (No. 2248).

Out of the large number of entries there are few of outstanding merit. Many competitors used types too large for the size of page specified.

It is evident that they did not realise the delicacy of treatment required in printing

*By kind permission of Messrs. Longmans Green and Co., Ltd., and Mr. Lloyd Osbourne.

poetry, and in many instances the setting was too heavy in *A Child's Garden of Verses*. Whilst the spacing was pleasing, the types selected resulted in a lack of proportion.

SUB-SECTION 2. *Three pages of Text set from type.*

The Judges were unable to recommend that a prize should be given, but the following awards were made :—

Highly Commended :

Albert David Croucher, London School of Printing. (No. 1303).

George Henry Dominy, London School of Printing. (No. 524).

Commended :

Albert David Croucher, London School of Printing. (No. 1301).

SUB-SECTION 3. *Line Drawings in black and white suitable to the size of the page and for reproduction by line block or wood engraving of (a) a headpiece and (b) a tailpiece*

The awards are as follows :—

A Prize of Three Guineas to Marcus Alexander Ball Campbell, 8 Rue de Montmorency, Boulogne-sur-Seine, France. (No. 1077).

A Prize of Two Guineas to Miss Beryl Maude Collings, Hornsey School of Art. (No. 2164).

Highly Commended :

Miss Mary Margaret Hurst, Sheffield College of Arts and Crafts. (No. 2851).

Walter Cecil Reynolds, International Correspondence Schools. (No. 227).

Commended :

Kisor R. Surkatha, Drawing and Design Class, Surat, India. (No. 3293).

Miss Margaret Joan Sweet, Hornsey School of Art. (No. 2169).

The Judges are pleased with the number and quality of the designs submitted, and they feel that the Competition is beginning to achieve the object for which it was established.

SUB-SECTION 4. *A Design for an illustration in black and white suitable to the size of the page and for reproduction by line block or wood engraving.*

The awards are as follows :—

A Prize of Five Guineas to Miss Isobel Elizabeth Board, Liverpool City School of Art. (No. 3148).

A Prize of Three Guineas to George Maurice Alcock, International Correspondence Schools. (No. 1776).

A Prize of Two Guineas to Miss Anne Evelyn Wilson, Liverpool City School of Art. (No. 3258).

Highly commended :

Miss Phyllis Garson Talbot, Liverpool City School of Art. (No. 3240).

Commended :

Miss Gladys Muriel Archer, Liverpool City School of Art. (No. 3137).

Miss Christine Mabel Mary Ball, Nottingham School of Art. (No. 844).

Marcus Alexander Ball Campbell, 8 Rue de Montmorency, Boulogne-sur-Seine, France. (No. 1076).

Miss Sylvia Straffen Iddes Davison, Sunderland School of Art. (Nos. 2268, 2269, 2270 and 2271).

Harcourt Medhurst Doyle, Liverpool City School of Art. (No. 3172).

Harry Stephen Faircloth, John Hassall Correspondence School. (No. 896).

Miss Enid Marjorie Ingall, Birmingham Municipal School of Art. (No. 1529).

Miss Edna Norton Jolley, Liverpool City School of Art. (No. 3212).

Miss Margaret Wilson Long, 14 Ave de la Marne, Asnieres, Seine, Paris. (No. 383).

Miss Marion Woolley, Nottingham School of Art. (Nos. 3128 and 3130).

Miss Natalie Mawby Wynne-Jones, Liverpool City School of Art. (Nos. 3260 and 3261).

The Judges are disappointed with the designs for an illustration of *Tobit*. The entries were few and generally of little merit, but the Judges recognise that the subject set was a difficult one. Only three designs were deemed worthy of serious consideration : each of these was quite distinctive in character and showed considerable merit.

The designs for an illustration of *A Child's Garden of Verses* were numerous and the quality on the whole was good. A number had to be ruled out on the ground of unsuitability for purpose and bad drawing. In several cases there was a very praiseworthy attempt at decoration in addition to design. The three prize-winning designs were outstanding in merit and suitability for purpose.

SUB-SECTION 5. *Designs for a Jacket as simple as possible and carried out in not more than three colours.*

The awards are as follows :—

A Prize of Three Guineas each to Miss Mary Elizabeth Brett, Guildford School of Art. (No. 1282) ; and

Miss Marjorie Winifred Wainwright, Liverpool City School of Art. (No. 3244).

A Prize of One Guinea each to Miss Nancy Allen Dixon, Liverpool City School of Art. (No. 3166) ;

Miss Faith Geraldine Leycester Gaskell, 22 Cyril Mansions, Battersea Park, S.W.11. (No. 1905) ;

Miss Constance Mary Whittle, Liverpool City School of Art. (No. 3251).

Commended :

Miss Isabel Hettie Beadle, Lewes School of Art. (No. 2223).

Miss Beryl Maude Collings, Hornsey School of Art. (No. 2173).

Miss Josephine Mary Ranger, Bournemouth Municipal College School of Art. (No. 3082).

Miss Molly Eluned Rees, Manchester School of Art. (No. 2783).

Miss Constance Mary Whittle, Liverpool City School of Art. (No. 3252).

SUB-SECTION 6. *Prize offered by the National Book Council for a Design (a pen and ink drawing) for a Cover for the Council's "Reader's Guides," suitable for a page 8 7/16" x 5 7/16".*

The awards are as follows :—

The Prize of Five Guineas (in books or cash) to Raymond Victor Robert, 16 Chinley Avenue, Moston, Manchester. (No. 1477c).

Commended :

Daniel William C. McKay, c/o Ross, 136 Glenthorn Road, West Jesmond, Newcastle-on-Tyne. (No. 1430).

Raymond Victor Robert, 16 Chinley Avenue, Moston, Manchester. (No. 1477b)

The entries as a whole were disappointing, but the prize-winning design shows distinct merit and originality.

SECTION V.—POTTERY AND GLASS

SUB-SECTION 1. (POTTERY). *A Model executed in Fired Pottery of a Morning Tea Set comprising cup and saucer, small plate, tea-pot, sugar bowl and cream jug, accompanied (at the option of the Competitor) by a wooden tray coloured or decorated in keeping with the set.*

The awards are as follows :—

A Prize of Two Guineas to Miss Doris Parton, Stoke-on-Trent School of Art. (No. 3493).

A Prize of One Guinea to Miss Hilda Mary Heath, Stoke-on-Trent School of Art. (No. 3482).

Commended :

Miss Kathleen Penney, Manchester School of Art. (No. 3540).

Miss Hannah Webb, Burslem School of Art. (No. 3579).

The exhibits were disappointing, the quality of work not being up to the standard of previous years ; in many cases the most elementary ideas of design or true decoration being lacking. Possibly the task set was a little harder than the Committee imagined : to ask for a " model " in fired pottery seems to presuppose that the competitors would produce new shapes made by themselves, as well as decorated by themselves ; this in most cases is almost impossible, and so they must acquire the white pieces, and many evidently got very cheap and ugly shapes which were obviously a handicap on any design put on them. There was very little originality in the decoration, and in many cases it was obvious from what source the designs had been taken.

From the large number sent in, twelve sets were selected for exhibition, but none were worthy of the full prize. No. 3493, by Miss Doris Parton, and No. 3482, by Miss Hilda M. Heath, were awarded smaller prizes because they showed a fair knowledge of placing the brightly-coloured design on each of the pieces. Amongst the other sets which were commended we should like to mention No. 3540, by Miss Kathleen Penney, which was a good attempt to make an original thrown shape, though proportions were not kept well in view ; the cream jug was very large, and the whole finished result heavy and crude. We should recommend this competitor to try again, to make lighter and better-proportioned pieces. No. 3488 (E. R. Owen) was another attempt at a new idea in shape, probably made crude and heavy looking by the decoration put on it.

No. 3543 (A. E. Barnett) is also worthy of mention for the break away in decoration from the predominating idea of over-glaze painting in enamel colours which most of the other exhibitors displayed.

SUB-SECTION 2. (POTTERY). A Model in Fired Pottery of an ornamental group of figures, animals or birds, suitable for placing on a mantelpiece or narrow shelf.

The awards are as follows :—

A Prize of Three Guineas to Arthur Ewart Barnett, Burslem School of Art. (No. 3546).

A Prize of Two Guineas each to the following :

Miss Muriel Joyce Bidder, Wimbledon School of Art. (No. 3504).

Miss Rose Dearing, Camberwell School of Arts and Crafts. (No. 3531).

Miss Kathleen Goodwin, 5 Kingsfield Oval, Basford, Stoke-on-Trent. (Nos. 3509 and 3512).

Very Highly Commended :

Miss Nora Youle Crossland, Sheffield College of Arts and Crafts. (Nos. 3588 and 3589).

Miss Rose Dearing, Camberwell School of Arts and Crafts. (Nos. 3532, 3533 and 3535).

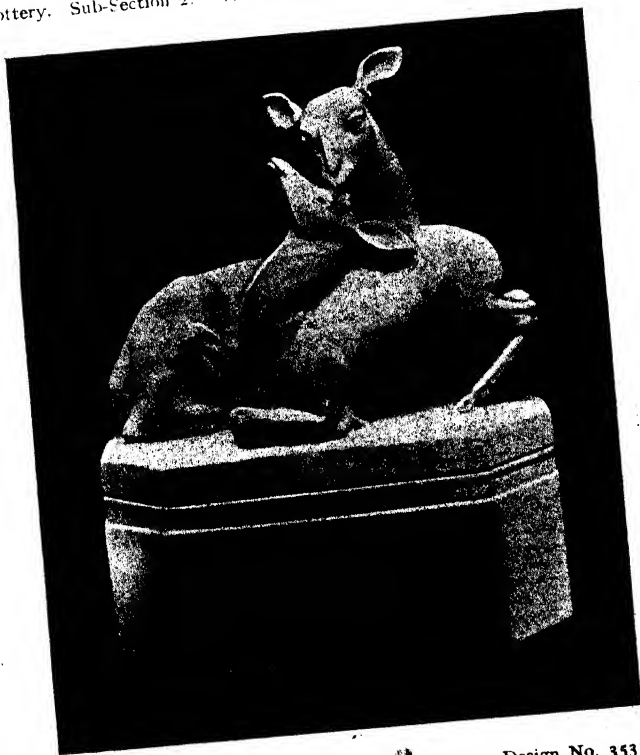
Highly Commended :

Miss Irene Emily Cordall, 81 York Street, Basford, Stoke-on-Trent. (No. 3499).

Miss Nora Youle Crossland, Sheffield College of Arts and Crafts. (No. 3590).



* Pottery. Sub-Section 2. Miss Muriel Joyce Bidder. Design No. 3594.



* Pottery. Sub-Section 2. Miss Rose Dearing. Design No. 3531.

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Miss Kathleen Goodwin, 5 Kingsfield Oval, Basford, Stoke-on-Trent. (Nos. 3510 and 3511).

Miss Mabel V. Hadgkiss, Burslem School of Art. (No. 3564).

John Empson Tindall, L.C.C. Central School of Arts and Crafts. (No. 3528).

Commended :

Eric Raymond Owen, Stoke-on-Trent School of Art. (No. 3489).

John Empson Tindall, L.C.C. Central School of Arts and Crafts. (No. 3529).

A model in fired pottery of an ornamental "group." This seems to presuppose two or more figures or animals grouped together. Some exhibitors who displayed most excellent models evidently overlooked this idea and sent in single figures or animals. Nevertheless it was felt that such exhibits should not be totally disregarded and in some instances awards were made to mark appreciation of the quality of the work in the modelling alone.

From the large number sent in eighteen were selected for exhibition, even though some were single figures and not groups. Not any single one of these stood out sufficiently to warrant the Judges in awarding the full prize but five were selected as being worthy of the prize being divided amongst them, because they most fulfilled the conditions laid down, as well as showing good modelling, practicability of making and decoration.

No. 3546, by Arthur E. Barnett, was excellent in its colouring and modelling.

No. 3504, by Miss Muriel Bidder, was a very spirited model showing a lot of action.

No. 3531, by Miss Rose Dearing, was also an excellent animal group.

Nos. 3509 and 3512, by Miss Kathleen Goodwin, were very charming in modelling and colouring.

Of those highly commended particular mention should be made of Nos. 3588, 3589 (Miss N. Y. Crossland) and 3533, 3535 (Miss R. Dearing). Here the modelling was very good indeed, but they generally did not fulfil the conditions laid down. Of the rejected ones many were either unsuitable for the purpose or too crude in modelling and colouring.

SUB-SECTION 3. (POTTERY). *A Commemorative Plaque suitable to be offered as an award in the Pottery and Glass Section of the Royal Society of Arts Competition of Industrial Designs. Competitors were invited to submit either (a) an original design for execution in pottery or glass, or (b) a model executed in fired pottery.*

The Judges were unable to make any awards in this Sub-Section.

Some good drawings were sent in, but none were adjudged worthy of the prize being awarded, because they were too complex and crowded in design, or did not sufficiently answer the requirements. The Judges regret that this competition, which to them appeared to be of a particularly attractive character, was not taken up more seriously.

SUB-SECTION 4. (GLASS). *An original design for a Perfumery Bottle—capacity not to exceed 5 ounces—suitable for the highest class perfumery trade, either plain, without decoration, or decorated in relief.*

The Judges were unable to recommend that a Prize should be given, but the following awards were made :—

Highly Commended :

Leonard Green, Wordsley School of Art. (No. 2345).

Commended :

Miss Helen Nairn Monro, 94 Warrender Park Road, Edinburgh. (No. 1418).

SUB-SECTION 5. (GLASS). *An original design for a Grape Fruit Glass, either plain or decorated.*

The Judges were unable to recommend that a prize should be given, but the following awards were made :—

Highly Commended :

Leonard Green, Wordsley School of Art. (Nos. 2347, 2348 and 2349).

Commended :

Ronald Adey, Stourbridge School of Arts and Crafts. (No. 2315).

The Judges regret the result in the Glass Sub-Sections is again somewhat disappointing.

The entries were limited in number and, although some of the designs are quite good and interesting, not a great deal of originality is displayed, many of the shapes being already on the market ; and again, the Judges do not think sufficient attention has been given, when designing, to the questions of cost and practicability of production.

Under these circumstances the Judges are unable to award any money prizes, but in Sub-Section 4 (Perfumery Bottles) they highly commend No. 2345, by Leonard Green, particularly for the top centre design, but consider this is somewhat weak from the shoulder upwards.

They also commend No. 1418, by Helen Monro, as a practical design for the purpose for which it is intended, and a good commercial proposition as regards production.

In Sub-Section 5 (Grape Fruit Glasses) they highly commend the group of designs Nos. 2347/8/9, by Leonard Green. They are all good as regards decoration, although not particularly novel in shape, and they also commend No. 2315, by Ronald Adey, as here they think great promise is shown, and should be encouraged.

SECTION VI.—ADVERTISING

POSTERS

SUB-SECTION 1. *Prize offered by the Blackpool Corporation Publicity Committee for a design for a Poster to advertise the Illuminations of Blackpool.*

The awards are as follows :—

The Prize of £25, and an additional Ten Guineas if the design is used as a Poster, to Frederick Brian Hayes, Bath School of Art. (No. 2448).

Highly Commended :

Frederick Brian Hayes, Bath School of Art. (No. 2447).

Miss Joan Horton, 23 South Hill Park Gardens, Hampstead, N.W.3. (No. 918)

Miss Hilda Florence Lancaster, Loughborough College School of Art. (No. 2660).

Commended :

Michael Leeds-Paine Reilly, Elmhurst, Lichfield Road, Four Oaks, Birmingham. (No. 697).

Stanley Taylor, Harris Institute School of Art, Preston. (No. 2828).

The first prize was awarded to F. B. Hayes' design No. 2448, which was considerably better than any others. Of the 43 entries, there were several which showed thought and executive ability, but some competitors did not sufficiently take into consideration the effect of enlargement to 16-sheet size. Even the prize-winning design needs some modification before reproduction.

SUB-SECTION 2. Prize offered by the British Electrical Development Association for a Design for a Poster advertising the uses of electricity in Rural Districts.

The Judges were unable to award the full prize to a single design, and the prize was accordingly divided as follows :—

A First Prize of £15 to Charles Douglas Morgan, Liverpool City School of Art. (No. 3225).

A Second Prize of £10 to John FitzGerald Lawrie, Bournemouth School of Art. (No. 3079).

The undermentioned awards were also made :—

Highly Commended :

Donald Edward Boden, " Brynton," Greenhill Road, Blackheath, Birmingham. (No. 294).

Miss Katharine Shirley Pearce, 196 Cromwell Road, Kensington, S.W.5. (No. 666).

SUB-SECTION 3. Prize offered by the British Poster Advertising Association for a Design for a Poster to advertise the advantages of Poster Publicity.

The Prize of £50 was divided as follows :—

A First Prize of £30 to William Hobson, 29 Farm Hill Square, Meanwood, Leeds. (No. 357).

A Second Prize of £20 to Alfred James Wray, Hackney Technical Institute School of Art. (No. 739).

The undermentioned awards were also made :—

Highly Commended :

Arthur Leslie Butler, 25 Sutherland Place, Bayswater, W.2. (Nos. 320 and 321).

Miss Margaret Sabina Smith, Bodifry, Walton, Aylesbury, Bucks. (No. 1504).

Commended :

Joshua Charles Armitage, Liverpool City School of Art. (No. 3140).

John Albert Badland, 94 Poole Crescent, Crossgates, Leeds. (No. 295).

Sydney Durant Banks, Northampton School of Art. (No. 2442).

Robert Collin, 76 Claude Road, Upton Park, E.13. (No. 1522).

Miss Katharine Eugenie Cynthia Cox, 11 Pemberley Avenue, Bedford. (No. 1324).

Harold Hemingway, Rochdale School of Art. (No. 2950).

McKean Edward Tatchell, " Beaulieu," Grange Crescent, Chigwell, Essex. (No. 1747).

Miss Lilian Margery Welch, 4 Cavendish Avenue, New Malden, Surrey. (No. 2029).

Robert Woodnorth, 21 Duke Street, Whitehaven, Cumberland. (No. 1754).

There were 160 entries for this Sub-Section, of which a considerable number had to be rejected without further consideration. There was a tendency to design posters which would equally well have served for press, window display, or any other form of advertising. Some of the entrants were inclined to design booklet covers rather than posters. Both the prize-winning designs were quite good. There was considerable ingenuity in the devising of slogans for posters; one or two, however, did not apply only to posters. The standard of lettering shows a welcome improvement: competitors are realising the paramount importance of legibility.

SUB-SECTION 4. Prize offered by Celestion Limited for a Design for a Poster advertising the Company's Loudspeakers.

The Judges were unable to recommend that the full Prize of £30 should be given, but the following awards were made :—

A Prize of £15 to Eugene Fancott, Liverpool City School of Art. (No. 3179).
Highly Commended :

Miss Dulcie Norah Glasgow Corner, Bournemouth School of Art. (No. 3071).
Commended :

Ronald Pearce Davis, 103 Fernside Road, Balham, S.W.12. (No. 341).

James Peter Joslin, 61 Hereford Street, Bethnal Green, E.2. (No. 605).

A degree of originality is apparent in most designs submitted. In a number of cases, however, originality has been over-developed at the expense of simplicity. In no case has the theme of the booklet cover, which was sent to each competitor, been exploited. This theme expressed "The Very Soul of Music," in the form of a gently-flowing river.

Design No. 3179, by E. Fancott, possesses a desirable motive, and stands out as unquestionably the most suitable for commercial reproduction. Miss D. N. G. Corner's design (No. 3071), has a good deal of artistic merit, but the design suffers through an excess of detail. Design No. 605, by J. P. Joslin, is ideally suited for commercial reproduction, owing to its having so few colourings, and therefore saving printing expenditure. With regard to the competition generally, the most important criticism which the Judges have to make is of a certain lack of simplicity in the colourings and in the execution of ideas.

SUB-SECTION 5. *Prize offered by Messrs. E. K. Cole, Limited, for a Design for a Poster to advertise their All-Electric Wireless Sets and All-Power Supply Units.*

The Judges were unable to recommend that the full Prize of £25 should be given, but the following award was made :—

A Prize of Seven Guineas to Edward Leigh Fisher, L.C.C. Camberwell School of Arts and Crafts. (No. 3593).

The entry in this Sub-Section was very disappointing. Of the nine designs submitted, three only showed good artistic merit. Of these No. 1365, by D. L. Glegg, was very pleasing in lay-out and general colourings, but in view of the omission of the name of the firm and the product, the Judges were unable to commend it. The design submitted by H. L. Rooke (No. 238) is too similar to the poster now issued by Messrs. E. K. Cole.

The winning design, submitted by E. L. Fisher (No. 3593), depicts in a clear and simple manner what is intended to be a very simple procedure. The colourings are good, but the design needs considerable adaptation of the figure and the armchair in order to make them stand out better from their surroundings.

SUB-SECTION 6. *Prizes offered by the Cunard Steam Ship Company, Limited, for a Design for a Poster advertising the Cunard Services to the United States of America and Canada.*

The total amount of Prizes offered, namely £30, was equally divided, and a Prize of £15 each was awarded to the following :—

Ronald Addis, Leeds College of Art. (No. 2617).

Rudolphe John Henry Pink Strube, 93 Turkenstrasse, Munich, Germany. (No. 1545).

The undermentioned awards were also made :—

Highly Commended :

Ronald Addis, Leeds College of Art. (No. 2616).

Fred Coates, 15 Bridle Path, Crossgates, Leeds. (No. 849).

Alfred Gordon Randall, 12 Manor Way, Uxbridge, Middlesex. (No. 1736).

Michael Leeds-Paine Reilly, Elmhurst, Lichfield Road, Four Oaks, Birmingham. (No. 699).

Commended :

Allan Constant Gardner, Edinburgh College of Art. (No. 3333).

Arthur Reginald Harrison, Royal College of Art. (No. 806).

John Fitzgerald Lawrie, Bournemouth School of Art. (No. 3080).

Charles Patrick Thompson, Weston-super-Mare School of Art. (No. 760).

In the opinion of the Judges the two prize-winning designs are of equal merit. The general standard in this class was promising, though the number of original ideas was not noticeable. The main weakness was a lack of attention on the part of the designer to the necessity for making the design *sell* something as well as draw attention to it.

The draughtsmanship in practically the whole of the exhibits is of low standard, and the attention to the detail of ships is poor.

SUB-SECTION 7. Prize offered by Henley's Tyre and Rubber Company, Limited, for a Design for a Poster advertising the Company's Giant Pneumatic Tyres.

The Judges were unable to recommend that the full Prize of £50 should be given, but the following awards were made :—

A Prize of £15 to Ian Ferguson, 37 Raeburn Place, Edinburgh. (No. 1344).

Commended :

William Arthur Arnold, 46 Cecil Road, Leytonstone, E.11. (No. 1072).

Sidney Vincent Dimond, L.C.C. Camberwell School of Arts and Crafts. (No. 1611).

Christian Petersen, Liverpool City School of Art. (No. 3228).

No design here merited the full award of £50, as none of them has any likelihood of being used commercially. The best design is No. 1344, by Ian Ferguson, to whom a prize of £15 is awarded.

In this Sub-Section several competitors have entirely ignored the conditions, which called for a poster advertising "Giant Pneumatic Tyres." Some designs were for racing bicycle tyres, others for pleasure cars. The general standard of design is very low and lacking in originality.

SUB-SECTION 8. Prizes offered by the Orient Line for a Design for a Poster advertising the Orient Line Mail Steamers to Australia.

The awards are as follows :—

The First Prize of £30 to Clarence Scott, Leeds College of Art. (No. 991).

The Second Prize of £10 to Hal Missingham, L.C.C. Central School of Arts and Crafts. (No. 1183).

In the event of the Orient Company publishing the prize-winning designs a further fee of £10 will be paid to the designer.

Highly Commended :

Miss May Adele Bilbie, Nottingham School of Art. (No. 3101).

Arthur Leslie Butler, 25 Sutherland Place, Bayswater, W.2. (No. 322).

John Joseph Irving, Liverpool City School of Art. (No. 3201).

Miss Rona Gladys Raymond, Hastings School of Art. (No. 2146).

Leslie William Turtle, Bournemouth School of Art. (No. 3086).

Commended :

Robert Colin, 76 Claude Road, Upton Park, E.13. (No. 1521).

Donal Lindsay Glegg, 9 Westleigh Avenue, Putney, S.W.15. (No. 1361).

Alfred Ernest Charles Hasler, Sir John Cass Technical Institute. (No. 1908).

Harold Hemingway, Rochdale School of Art. (No. 2955).

Miss Cecilia Honora Murphy, Liverpool City School of Art. (No. 3227).

John Stoddard, Burslem School of Art. (No. 3286).

Percival Albert Trompf, Henty House, 501 Little Collins Street, Melbourne, Victoria, Australia. (No. 3061).

John Stuart Webster, Liverpool City School of Art. (No. 3246).

The general standard of the entries was not so high as last year; overcrowding with detail was more evident, and many of the designs lacked originality. One good design (No. 3227), by Miss C. H. Murphy, combining an effective poster with a good idea, was of the wrong shape and could not be considered for a prize. Another effective poster (No. 322), by A. L. Butler—perhaps the most striking of all—was unsuitable because the horseman depicted on the map of Australia was dressed in accurate American cowboy costume, which bears no resemblance to any form of dress prevalent in Australia.

The first prize was given to design No. 991, by C. Scott, a clever silhouette of two native bears against the moon. The green background of the sky might be criticised as too dark for an effective poster, but the judges considered that the black silhouette was perhaps strong enough to surmount this objection.

The second prize was allotted to a lighter design in a more modern manner (No. 1183), by H. Missingham, with kangaroos intelligently used, and assisting instead of hindering the design.

Many attempts were made at incorporating kangaroos, and two others were highly commended (Nos. 2146 and 3086). Some Modernist designs were worthy of notice. No. 2055, incorporating the idea of "down under," was somewhat obscure in meaning. The same applies to No. 1361, by D. L. Glegg, which, at the same time, contains the germ of a good idea.

A good example of failure to represent correct detail, and consequent failure to produce a suitable bill, was No. 3286, by J. Stoddard, a very effective design based on funnel shapes, but unsuitable owing to the fact that no Orient ship has three funnels and that the funnels were incorrectly coloured.

SUB-SECTION 9. Prize offered by the Prudential Assurance Company, Limited, for a Design for a Poster advertising Insurance in general and that Company in particular.

The Judges were unable to recommend that the full prize of 25 guineas should be given, but the following awards were made:—

A Prize of Five Guineas each to

Thomas Hancock, 507 North Road, Darlington (No. 137), and

Reginald Arthur Hobbs, 9 Heath Drive, Raynes Park, S.W.20 (No. 1927).

SUB-SECTION 10. Prize offered by Messrs. Watney Combe Reid and Company, Limited, for a design for a Poster advertising Reid's Special Stout.

The awards are as follows:—

The Prize of £25 to Clarence Arnold Pennington, Widnes Municipal Technical College. (No. 220).

Highly Commended:

John Fletcher, International Correspondence Schools. (No. 350).

Commended:

Brian Montagnol Gilks, 88 Claverton Street, S.W.1. (No. 1125).

The competitors do not display sufficient originality. Many of the designs submitted are derived from posters that have already been on the hoardings. There is a tendency to employ too much detail in a number of the designs, and in many cases insufficient attention is given to the selling value of the poster. In some instances a touch of vulgarity spoiled the design, and might well have been omitted.

SHOWCARDS

SUB-SECTION 11. *Prize offered by British Celanese Limited for a Design for a Showcard to advertise either the fabrics of British Celanese Limited, lingerie or hosiery.*

The Judges were unable to recommend that any prize should be given, but the following awards were made :—

Highly Commended :

Miss Violet Emily Lander, L.C.C. Camberwell School of Arts and Crafts. (No. 1402).

John Edward Meade, Bromley School of Art. (No. 1179).

The Judges regret that, although there were a large number of entries, the standard of design was very low, and was lacking in ideas and workmanship.

SUB-SECTION 12. *Prize offered by Sir Joseph Causton and Sons, Limited, for a Design for a Showcard advertising Jams.*

The Judges were unable to make any awards in this Sub-Section.

The designs in this sub-section are disappointing. There is little or no originality and the draughtsmanship is poor. There is no design of sufficient merit to warrant the award of a prize.

SUB-SECTION 13. *Prize offered by Messrs. W. T. Henley's Telegraph Works Company, Limited, for a Design for a Showcard to advertise the Henley Wiring System.*

The Judges awarded the prize of £25 as follows :—

A Prize of £15 to John Empson Tindall, 38 Pennard Road, W.12. (No. 3310).

A Prize of £10 to John Empson Tindall, 38 Pennard Road, W.12. (No. 3311).

The following awards were also made :—

Highly Commended :

Ashley Bellinger, The British and Dominions School of Drawing. (Nos. 1 and 3).

Leslie Walter Low, L.C.C. School of Photo-Engraving and Lithography. (No. 933).

Except for the two designs for which the prizes are awarded, and also No. 87, no design gives the impression that the wiring is an unobtrusive *surface* wiring system. The designs are all pleasing and have artistic merit, but except for those mentioned, fail in the advertising appeal. No. 87 tends to show the advantages of electricity generally, instead of Henley's wiring system in particular.

SUB-SECTION 14. *Prize offered by Messrs. Maconochie Brothers, Limited, for a Design for a Showcard for their " Trident " Salmon and Shrimp Paste.*

The awards are as follows :—

The Prize of Ten Guineas to Miss Marjory Elgar, Bournemouth School of Art. (No. 3075).

Highly Commended :

Miss Phyllis Frecaut Burkinshaw, Liverpool City School of Art. (No. 3149).

The general standard is not very high. Competitors have in most instances sacrificed advertising value in order to obtain artistic effects without outstanding success.

Miss M. Elgar's design (No. 3075) has originality and good draughtsmanship.

SUB-SECTION 15. *Prizes offered by Messrs. Rowntree and Company, Limited, for a Design for a Showcard to advertise their York Milk Chocolate.*

The awards are as follows :—

The First Prize of £20 to Miss Sylvia Straffen Iddes Davison, Sunderland School of Art. (No. 2272).

The Second Prize of £10 to William Grundy, Halifax Municipal Technical College School of Art. (No. 2542).

Highly Commended :

Miss Agnes Louise Hastings, Liverpool City School of Art. (No. 3186).

Miss Dilys Mary Powell, Salford Royal Technical College School of Art. (No. 2923).

Commended :

Miss Joan Hilda Beer, Liverpool City School of Art. (No. 3145).

Miss Agnes Louise Hastings, Liverpool City School of Art. (No. 3185).

The Judges are satisfied that a good deal of thought has been given to the subject, and it is gratifying to see so many entries. The chief causes of failure are the tendency to make the designs too involved and the lettering not sufficiently readable. Some of the designs were not quite original.

SUB-SECTION 16. Prizes offered by Messrs. Simpson and Godlee, Limited, for a Design for a Showcard based on their "Rockfast" Dye Trade-Mark.

The Judges were unable to make any awards in this Sub-Section.

In view of the scope offered and the value of the prizes, the Judges consider that some adequate response might reasonably have been expected. They regret however, that they are unable to accept a single design for exhibition, the conception and interpretation of the problem being very weak.

LORRY BILL

SUB-SECTION 17. Prize offered by Shell-Mex Limited for a Design for a Lorry Bill to advertise either Shell Lubricating Oil or Shell Petrol, or both.

The Judges were unable to recommend that the full amount of the prize should be given, but the following awards were made :—

A Prize of Ten Guineas to :

James Reddoch, Liverpool City School of Art. (No. 3232).

Commended :

Leonard Monro Boden, Glasgow School of Art. (No. 487).

Edward Bishop, L.C.C. Central School of Arts and Crafts. (No. 1561).

The Judges regret that they have been unable to find any one of the designs of sufficiently high a standard to justify the full award. They have purposely set a high standard in the interests of the competitors, as it appears obvious to them that many should realise at once that they are unlikely to be successful at poster designing.

The Judges call attention to a few of the more obvious faults. A white ground is unsuitable for a bill that is to be placed on motor lorries in constant use owing to its rapid accumulation of dirt. Almost without exception the lettering was of a very low standard, and it appears to the Judges from the evidence before them that Art Schools are not paying sufficient attention to this point.

The draughtsmanship was in most cases below the level which might be expected in a competition of this sort.

Despite these minor criticisms the Judges consider that the most serious fault among the competitors is a general lack of appreciation of the spirit of the age. For the most part the designs submitted might well have been composed 20 or 30 years ago, when advertising was at an abnormally low level. The chief merit that emerged was a conspicuous consciousness of the difference between posters and paintings. The colours used were reasonably well chosen and due regard was paid to their economical use.

CATALOGUE COVERS

SUB-SECTION 18. *Prize offered by Messrs. James Shoolbred and Company, Limited, for a Design for the cover of a Monthly Food List.*

The Prize of Ten Guineas was divided equally, a Prize of Five Guineas each being awarded to :

Derek Anderson Kelsey, 2 Cumberland Mansions, Upper George Street, W.1 (No. 1968) ; and

Miss Margaret Mower-White, 112 Harley Street, W.1. (No. 2043).

SUB-SECTION 19. *Prize offered by Messrs. James Shoolbred and Company, Limited, for a Design for the cover of a Furniture Sale Catalogue.*

The awards are as follows :—

A First Prize of Ten Guineas to Alfred Ernest Charles Hasler, Sir John Cass Technical Institute. (No. 1910).

A Second Prize of Five Guineas to Robert Fidler, 4 Hesketh Street, Sefton Park, Liverpool. (No. 348).

Commended :

Miss Alice Ashcroft, 14 Grosvenor Road, Urmston, Manchester. (No. 876).

Frank Robert Carter, Prahran Technical School, 130-140 High Street, Prahran, Melbourne, Australia. (No. 3300).

BOXTOP

SUB-SECTION 20. *Prize offered by Sir Joseph Causton and Sons for a Design for a Boptop and sides for Biscuits.*

The Prize of Fifteen Guineas was divided as follows :—

A Prize of Ten Guineas to Miss Bertha Julia Olyett, 81 Richmond Road, Ilford, Essex. (No. 1806).

A Prize of Three Guineas to Leslie Dugdale, 154 Hessle Road, Hull. (No. 46).

A Prize of Two Guineas to Miss Bertha Julia Olyett, 81 Richmond Road, Ilford, Essex. (No. 1805).

The competitors have made no effort to appreciate the fundamental principles of box-label designing.

No. 1806, by Miss B. J. Olyett, shows promise and has been carefully thought out, the treatment being in harmony with the subject.

Design No. 46, by L. Dugdale, and No. 1805, by Miss B. J. Olyett, show sufficient originality to be awarded prizes for further encouragement.

CHRISTMAS CARDS AND CALENDARS

SUB-SECTION 21 (a). *Prizes offered by Messrs. E. W. Savory, Limited, for designs for Christmas Greeting Cards.*

The awards are as follows :—

A Prize of Five Guineas to Miss Mary Agnes Mack, 223 Second Street, Cornwall, Ontario, Canada. (No. 193d).

A Prize of Three Guineas to Miss Joyce Mercer, 13a Campden Houses, Peel Street, Kensington, W.8. (No. 1971).

A Prize of Two Guineas each to :

Miss Audrey Isobell McLaughlin, Royal College of Art. (No. 646d) ; and

Raymond Victor Robert, 16 Chinley Avenue, Moston, Manchester. (No. 1481b) .

Commended :

Miss Mary Elizabeth Brett, Guildford Technical Institute School of Art. (No. 1283).

Miss Fanny Josephine Clifford, Hanger Hill, Cheadle, Stoke-on-Trent. (No. 893)

Fulchand P. Shah, Drawing and Design Class, Surat, India. (No. 3292).

Many of the designs submitted, although attractive in themselves, were not suitable for Christmas Cards, and the lack of originality was very marked.

SUB-SECTION 21 (b). *Prizes offered by Messrs. E. W. Savory, Limited, for designs for Flat Calendars.*

The awards are as follows :—

The First Prize of Ten Guineas to Miss Gwendoline Dolman, Sheffield College of Arts and Crafts. (No. 2840).

A Prize of Two Guineas to Miss Jeannette Ellen Fanshaw, Cotmore Wells, Thame, Oxon. (No. 1054).

Commended :

Mrs. Bertram E. Sargeant, Belmont, Douglas, Isle of Man. (No. 1227).

LEATHER WORK

SUB-SECTION 22. *Prizes offered by Messrs. E. W. Savory, Ltd., for designs for Decorative Leather Work suitable for Blotters, Handbags, Pochettes, Bridge-markers, etc.*

The awards are as follows :—

The First Prize of Ten Guineas to Miss Katherine Russell Drummond, 30 Hart Grove, W.5. (No. 745).

The Second Prize of Five Guineas to Mrs. Annie Riley, "Pines," Manor View, Finchley, N.3. (No. 668).

Highly Commended :

Mrs. Aileen Burton, Stalham and District School of Arts and Crafts. (Nos. 2297, 2298 and 2299).

Miss Katherine Russell Drummond, 30 Hart Grove, W.5. (Nos. 743, 744 and 746).

Mrs. Annie Riley, "Pines," Manor View, Finchley, N.3. (Nos. 669 to 673).

Commended :

Miss Audrey Joan Martin, "Alouette," Shenfield Road, Brentwood, Essex. (Nos. 1669 and 1670).

There was a very good competition among the 16 competitors in this sub-section both in design and craftsmanship. The two prize-winning designs are in a class by themselves. Miss K. R. Drummond's design, No. 745, is a good design based on a sound tradition, and Mrs. A. Riley's design, No. 668, is gay and attractive to a purchaser.

TRADE MARK

SUB-SECTION 23. *Prize offered by British Celanese, Limited, for a Design for a Trade-Mark Symbol to represent the various products of the Company.*

The awards are as follows :—

The Prize of Twenty Guineas to Edward Bishop, L.C.C. Central School of Arts and Crafts. (No. 1563).

Highly Commended :

Miss Elspeth Murray Anderson, Auchengower, Cove, Dunbartonshire, Scotland. (No. 859).

Edward Bishop, L.C.C. Central School of Arts and Crafts. (No. 1562).

John Buchanan, Hornsey School of Art. (No. 3039).

Paul Edward Smith, Nottingham School of Art. (No. 3122).

Commended :

John James Heath, Keighley School of Art and Crafts. (No. 2562).

This was a popular competition and showed some understanding of the purpose of a trade-mark symbol. There was one outstanding design, No. 1563, by E. Bishop, and to this the prize has been awarded.

CORRESPONDENCE

MODERN ARCHITECTURAL SCULPTURE

Surely Mr. Gill ruins his argument by over simplifying it. Architectural sculpture, says he, must be good or bad, according to its function. If it is part of the necessary furniture of the building, it is good; if a mere excrescence—an attempt to add mere beauty to a building, it is bad. The “reclining ladies and gentlemen over the doorway of Australia House” are bad because they are merely sugar on the pill. Yes, but suppose they “proclaimed the nature” of Australia House; suppose they were easily recognisable as Sydney and Melbourne, or Don Bradman and Woodfull; suppose they had been kangaroos, would they automatically become good? Oh, but surely, Mr. Gill, this functional test of goodness and badness is only one half of æsthetics, or, rather, it is not æsthetics at all. Our simple cliff-like buildings of steel and concrete may be “furnished” with Britannias for England or Tigers for India, but suppose Mr. Gill were too far away from them to distinguish Britannia from the tiger, couldn’t we still think them pleasant breaks in the concrete cliff, and if on approaching nearer he found them pleasant in themselves, couldn’t he think them good, and if on coming nearer still he found that they had been put by mistake on the wrong buildings, need he at once think them bad? Industrialism is not the only parent of the concrete building. Its father may have been commerce, but its mother was certainly good taste. The Gothic mason has not been replaced by the shoveller of cement, but, say, the architect. The difference is *not* one of *kind*, as Mr. Gill suggests, but, surely one of *size*. The architect of to-day moulds his concrete as lovingly as the mason of old carved his stone. Why, then, should he not enrich its surface as justifiably now as then?

ERIC NEWTON.

The Corner,
Manor Drive,
Wingfield Park,
West Didsbury.

GENERAL NOTE

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH. BUILDING RESEARCH. BULLETIN ON ULTRA-VIOLET WINDOW-GLAZING.—At the present time considerable interest is being shown in the effect of the ultra-violet rays on sunlight upon the human body and in window glasses which transmit them. The literature of the subject is wide, but there is little of scientific value in a form accessible to architects and builders. In response to the frequent inquiries received at the Building Research Station from members of the building industry, a brief summary of the relevant facts is given in this bulletin. The physical factors which bear on the physiologically active radiation of sunlight are here briefly considered and the development and properties of ultra-violet transmitting window glasses are discussed. After a theoretical examination of the intensity distribution of ultra-violet radiation in a room glazed with special glass, the conditions under which this glass may be used with greatest effect are indicated. The Building Research Station has, of course, no responsibility for the medical opinions quoted. The Bulletin, price 4d. (postage extra) may be obtained from H.M. Stationery Office, Adastral House, Kingsway, London, or through any bookseller.

MEETINGS OF OTHER SOCIETIES DURING THE ENSUING WEEK

MONDAY, OCTOBER 13. Automobile Engineers, Institution of, at the Merchant Venturers' Technical College, Bristol. 7 p.m. Sir Herbert Austin, Presidential Address on "The Future Trend of Automobile Design."

Brewing, the Institute of, at the Claring Cross Station Hotel, Strand, W.C. 7.45 p.m. Discussion on "The Breeding of New Varieties of Hops, with special reference to the Requirements of the Brewer." Speakers: Prof. F. S. Salmon, Mr. F. I. Neame, Dr. T. K. Walker, Mr. H. L. Hind and Mr. E. B. Collier.

Transport, Institute of, at the Institution of Electrical Engineers, Savoy Place, W.C. Presidential Address by the Hon. Sir Arthur Stanley.

University of London, at Bedford College for Women, Regent's Park, N.W. 3 p.m. Prof. Penon, "The Congress of Vienna (1814-1815)."

At King's College, Strand, W.C. 5.30 p.m. Prof. R. W. Seton-Watson, "The History of Serbia Lecture I—Serbia in the Middle Ages (till 1389)."

At the London School of Economics, Aldwych, W.C. 4.30 p.m. Mr. P. Vacher, "Political Parties in France, 1814-1880." (Lecture I.)

At University College, Gower Street, W.C. 5 p.m. Dr. H. P. Gilding, "The Reticulo-Endothelial System." (Lecture I.)

TUESDAY, OCTOBER 14 British Academy, Burlington Gardens, W. 5 p.m. Prof. R. S. Conway, "Virgil's Creative Art." (Joint Lecture with the Chemical Association and the Society for the Promotion of Roman Studies.)

East India Association, at Caxton Hall, Westminster, S.W. 4.30 p.m. General Sir George Barrow, "The Army in India and Constitutional Reform."

Marine Engineers, Institute of, 85 The Minories, E.C. 6 p.m. Mr. Oswald Wans, "The Design and Manufacture of Marine Auxiliary Oil Engines."

Metals, Institute of, at Armstrong College, Newcastle-on-Tyne. 7.30 p.m. Address by Mr. C. Gresty, Chairman of the Local Section.

Petroleum Technologists, Institution of, at the ROYAL SOCIETY OF ARTS, Adelphi, W.C. 5.30 p.m. Mr. H. S. Glyde, "Experiments to Determine Velocities of Flame Propagation in a Side-Valve Petrol Engine."

Philosophical Studies, British Institute of, at the ROYAL SOCIETY OF ARTS, Adelphi, W.C. 8.15 p.m. Professor Sir Percy Nunn, "The Philosophy of Professor Whitehead."

University of London, at Bedford College for Women, Regent's Park, N.W. 10 a.m. Miss Johnson, "Guillaume d'Angleterre."

12 noon. (1) Miss Ellis-Fermor, "Marlowe and the Elizabethan World." (2) Miss Tarrant, "History of Greek Philosophy." 3 p.m. Prof. Spencer, "History of Chemistry."

At King's College, Strand, W.C. 5 p.m. Dr. J. W. Pickering, "Blood Plasma and Platelets." (Lecture II.)

5.30 p.m. Prof. Sir B. Pares, "Contemporary Russia. Lecture II—The Great Reforms."

At the London School of Economics, Aldwych, W.C. 5 p.m. Mr. J. A. Hobson, "Towards Social Equality."

WEDNESDAY, OCTOBER 15. Anthropological Institute, at the Portland Hall, Little Titchfield Street, Oxford Street, W. Prof. J. L. Myers, "Native Races of the Empire: Facts and Problems."

British Academy, Burlington Gardens, W. 5 p.m. Mr. G. S. Gordon, "Virgil in English Poetry." (Joint Lecture with the Classical Association and the Society for the Promotion of Roman Studies.)

Central Asian Society, at Burlington House, W. 5 p.m. The Hon. W. Astor, "Chinese Personalities."

Engineering Inspection, Institution of, at the ROYAL SOCIETY OF ARTS, Adelphi, W.C. 5 p.m. Mr. Edwin Harle, "A Practical Application of British Standard Limits and Fits to Locomotive Construction."

Microscopical Society, at the B.M.A. House, Tavistock Square, W.C. 5 p.m. Mr. J. E. Barnard will demonstrate by Micro-Projection some Historical Preparations from the Society's Collection. Dr. G. M. Findlay will communicate some recent research on Malarial Parasites.

Public Health, Royal Institute of, 37 Russell Square, W.C. 4 p.m. Dr. E. Graham Little, "The Prevention of Accidents, Disorders and Disease in Members of the Medical and Nursing Professions."

University of London, at Bedford College for Women, Regent's Park, N.W. 10 a.m. Miss Govenor, "Elizabethan Poetry."

11 a.m. Signorina Dobelli, "Machiavelli."

1.15 p.m. Miss Ellis-Fermor, "The Drama in Modern Europe."

At King's College, Strand, W.C. 5.30 p.m. Mr. D. S. Mirsky, "Russian Literature in its Relation to Russian Social History (1740-1860). Lecture I—Introductory Remarks on the Method of Literary History."

At King's College, Strand, W.C. 5.30 p.m. Sir H. Rolleston, "Professions and Careers. Lecture II—Medicine."

At the London School of Economics, Aldwych, W.C. 5 p.m. Prof. J. Coatsman, "The Economic Future of the Empire."

6 p.m. Lecture on "Office Machinery" (II.)

At University College, Gower Street, W.C. 5.30 p.m.

Prof. C. K. Allen, "Legal Duties." (Lecture I.)

5.30 p.m. Mr. J. H. Helweg, "Danish Castles and Manor Houses." (Lecture I.)

THURSDAY, OCTOBER 16. Antiquaries, Society of, Burlington House, W. 8.30 p.m.

Chemical Society, Burlington House, W. 8 p.m.

Unveiling of the Perkin Memorial Plaque. Oration on the Life and Work of the late Professor W. H. Perkin, by Professor Dr. W. N. Haworth.

Mining and Metallurgy, Institution of, at Burlington House, W. 5.30 p.m.

University of London, at King's College, Strand, W.C. 5 p.m. Dr. J. A. Hewitt, "The Metabolism of Carbohydrates and Fats." (Lecture I.)

5.15 p.m. Miss C. Maxwell, "Social and Political Ideas of some Representative Thinkers of the Age of Reaction and Reconstruction. Lecture II—Chateaubriand and the French Romantics."

5.30 p.m. Mr. H. W. Steed, "The Suicide of Austria-Hungary, 1908-1914. Lecture III—The Roumanian Factor."

At University College, Gower Street, W.C. 5 p.m. Prof. E. A. Gardner, "Greek Myths and their Representation in Art." (Lecture I.)

5.30 p.m. Prof. Edmund G. Gardner, "The Psychology of Dante."

FRIDAY, OCTOBER 17. British Academy, Burlington Gardens, W. 5 p.m. Dr. J. W. Mackail, "Virgil." (Joint Lecture with the Classical Association and the Society for the Promotion of Roman Studies.)

British Electrical Development Association at the ROYAL SOCIETY OF ARTS, Adelphi, W.C. 7.30 p.m. Lt.-Col. W. A. Vignoles, "An American Tour and Experiences."

Iron and Steel Institute, at the Royal Technical College, Glasgow. 7.15 p.m. (1) Mr. H. C. Wood, "Open-Hearth Furnace Steelworks—a Comparison of British and Continental Installations and Practice." (2) Mr. J. Sarek, "What Reasons Compelled the Prague Ironworks to introduce Thin-Walled Blast Furnaces."

Historical Society, at 22 Russell Square, W.C. 5.30 p.m. Prof. F. J. C. Hearnshaw, "Disraeli."

Physical Society, at the Imperial College of Science, Imperial Institute Road, South Kensington, S.W. 5 p.m.

University of London, at King's College, Strand, W.C. 5.30 p.m. Mr. E. J. Forsdyke, "The Delphic Festival."

At the London School of Economics, Aldwych, W.C. 2.30 p.m. Dr. W. Rose, "German Life and Literature from 1770 (with a special reference to the Life and Works of Goethe)." (Lecture I.)

SATURDAY, OCTOBER 18. L.C.C. The Horniman Museum, Forest Hill, S.E. 3.30 p.m. Prof. J. R. Ainsworth Davis, "The Uses of a Tail."

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No 4065

FRIDAY, OCTOBER 17th, 1930

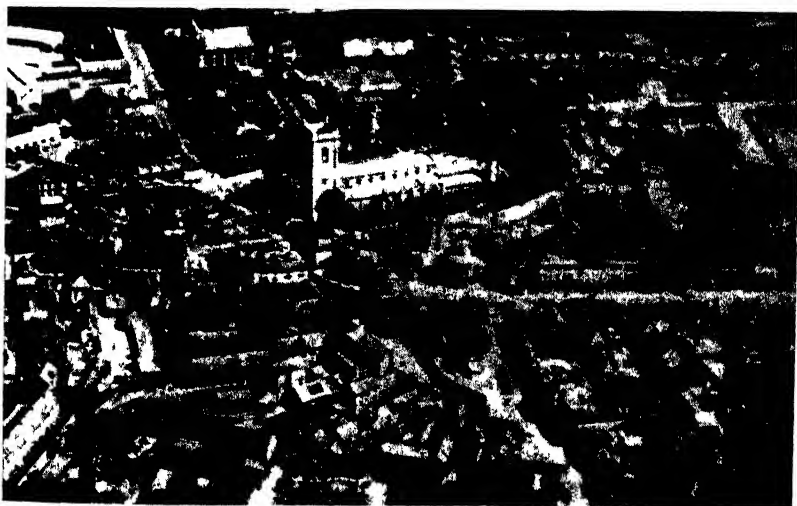
VOL LXXVIII

All Communications for the Society should be addressed to the Secretary, John Street, Adelphi, W C.2

NEWS OF THE WEEK

"For the last hundred years the destruction of beauty has been our great national sin" Professor G M Trevelyan

High Wycombe.—In connection with the references to the bypassing of High Wycombe in the *Journal* for October 3rd, the picture (shown below) of the town from the air, will be of interest, as showing the extraordinary complication of



its planning. It will be seen from this how completely the Corn Market and Guildhall over, with Robert Adam's interesting little Butter Market and the Church Square opposite, prevent any logical replanning if these characteristic buildings

are to be preserved. We visited the Guildhall a day or two ago and found a very finely proportioned room and stairway thereto, the latter darkened, unfortunately, by the recent introduction of stained glass of the worst type, making it impossible to see the pictures on the staircase. The object of this visit was to see some topographical paintings of West Wycombe. We found two, also a quite interesting portrait group of Philip, Lord Wharton, and his wife and son, dated 1656. Naturally there was a portrait of Disraeli, so long associated with the town of High Wycombe, but quite negligible, as a work of art, as compared with the group referred to.

While at High Wycombe we also tried to find a picture entitled "St. Paul preaching to the Ancient Britons" and given to High Wycombe Church as an altar piece by Dr. Bates of Little Missenden when the artist, John Hamilton Mortimer, was buried there. It will be interesting to Fellows to know that Mortimer was Vice-President of the Society of Arts in 1773; R.A. 1779, the year of his death. With this picture he won a hundred guineas premium given by the Royal Society of Arts, with Romney as a competitor, and when the latter was quite a young man in London. Mortimer painted many historical and allegorical pictures. It would be very interesting to know whether the picture painted as an altar piece for High Wycombe Church still exists.

One Amusement After Another.—We cannot help quoting the following from a letter contributed by Professor W. R. Lethaby to the correspondence which has been recently carried on in *The Times* as to the apparent tendency of modern children to require a constant succession of amusements, such as cinemas, golf, etc., usually involving the expenditure of money, and their seeming loss of the power to amuse themselves in more natural ways. Professor Lethaby's remarks seem to us full of wisdom in their bearing on the education of the child:—

"This is a large and serious question affecting not only young people but the whole national character. May I suggest that one corrective would be found in returning to the custom of encouraging children to make their own toys? The most valuable office of games and toys is to introduce ideas of doing and making into young minds. Making toys is much more important than playing with them. The present-time flood of shop-bought, and largely imported, toys is to encourage the breaking rather than the making mind.

Bungalomania.—There is evidently a considerable curiosity to see the picture of Mr. Stanley Casson's unarchitected bungalow in its perfect setting of Cornish scenery. Will he respond to Mr. William Davidson's suggestion in *The Spectator*, and send us a photograph for reproduction in the *Journal*? Mr. J. M. Godley (in last week's *Spectator*) rightly points out that photographs are very deceptive, and that it is the colour of the materials which is generally so destructive. However, with a little imagination and Mr. Casson's description of the materials, it should be possible to visualise the bungalow in its setting, and make useful comments thereon.

Downing Street.—Why does the *Daily Mail* describe the Prime Minister's house here as the most out of date house in England? From some knowledge of its rooms we recollect them as dignified and well-proportioned. The surroundings are beautiful and characteristic of London. The place is full of character although its internal arrangements may be at fault for modern usage; this surely only requires clear thinking to remedy. The house possibly is modest as a residence for so great an officer of the Crown and hardly worthy as the London residence of the temporary occupant of so lovely a place as Chequers. Lansdowne House is going begging, and the owners would do a National service if they would make it possible for the property to be acquired for this or some other National purpose.

Wall Painting in the Duncannon Hotel.—The demolition of the Golden Cross Hotel in Duncannon Street, Charing Cross, can scarcely be a matter for regret in spite of its association with Dickens and his David Copperfield, for the building is not prepossessing. But it will be a great pity if the delightful wall paintings by A. R. Thompson and I. M. Cameron, in the saloon bar of the Duncannon Hotel, which occupies some of the space under the Golden Cross, are allowed to perish. Apparently few people besides the habitués of the Duncannon bar are aware of the existence of these paintings of incidents from the Pickwick papers, treated in an unusually light-hearted and humorous spirit, suggesting a grotesque and yet charming ballet. They are painted directly on to the wall paper, or, in some cases, cut out in wallpaper and pasted on, and then varnished, and their delicate and mellow colouring is as attractive as their fantastic design.

The last time we went to look at them we were told that at one time the proprietors of the hotel had issued a booklet describing them and the occasion that led to their being painted, but copies of this are no longer obtainable.

Before this typically unpleasant piece of modern public house building is removed, it should be visited by all interested in decorative wall painting. The interesting experiments at South Kensington by Mr. Rex Whistler and at Morley College, have interested the public in the possibilities of work of this kind. Here very unique talent seems to have been wasted by occupying ill-designed wall spaces with decoration of great fanciful beauty and style. It is pitiable to see such capacity in such an impossible setting.

Art Galleries.—LONDON GROUP. New Burlington Galleries. Till October 31st.—The twenty-eighth exhibition of the London group is remarkably rich in good pictures, and in promising work by young artists. There is variety, but the selectors of the group are faithful to their standards, and nowhere on the walls do we find anything purely emotional, purely romantic, or merely accomplished.

Mr. Morland Lewis's *Scotch Pill* (No. 9) is an attractive, strong little picture.

well designed, and carried out in warm colours of a texture very satisfying to the eye. Mr. Allan Walton's *Mill Stream* (No. 15) is also beautiful for its paint. The wide *Dorset Landscape* (No. 24), by Mr. Elliott Seabrooke, is full of natural beauty, though as usual with this artist, designed with the utmost deliberation. *Through the Pines*, by Mr. Frederick Porter (No. 27) should be noticed. *Roses* (No. 28), has the original quality that Mrs. Vanessa Bell sometimes puts into her flower pieces—not that her work is not beautiful, even very beautiful, when more closely resembling the style of Mr. Duncan Grant.

Mr. Bernard Adeney's *Fittleworth Bridge* (No. 50) is charming, perhaps more so than his larger pictures here. Mr. Noel Gilford's *Country Window* (No. 53) is interestingly designed, though not altogether strong enough. Mrs. Raverat's *Road by the Pond* (No. 67) is slighter, but also attractive and quietly poetical.

Mr. George Mostyn, who exhibits here for the first time, has a *Loing at Montigny* that is very pleasing (No. 97). It seems to be the expression of an attitude towards nature not unlike Corot's. In the small room we find the *Carrara Mountains* (No. 184), delicate but sure, by Julian Trevelyan, and *Arab Woman* (No. 207) strong, though (one feels) transitional, by A. Clutton Brock.

The large room has, among many things, a Grant and a Sickert that must not be missed; a Paul Nash and an Adrian Allinson; a Roger Fry (not so good as the landscape, No. 11); and a number of sculptures.

EXHIBITION OF FURNITURE AND FURNISHINGS DESIGNED BY FRANK BRANGWYN, R.A.—The Exhibition, which Messrs. Pollard have organised and are holding at 299 Oxford Street, of furniture, pottery, glass and carpets, designed by Frank Brangwyn, R.A., is interesting, not only because it shows Mr. Brangwyn as a designer of household things which are likely to be known to posterity as typical of the best work of the present day, but also because it is bound to alter, if only slightly, the whole status of the so-called "commercial" artist and designer. The present system by which the artist works in obscurity while the firm, which employs him, exploits him by selling the things he has designed under its own name, is unfair to the artist, misleading to the public, and does not, in the long run add glory to the manufacturer. Messrs. Pollard have realised this and shown their good judgment as well as their good taste in putting their best materials and workmanship at Mr. Brangwyn's service.

The furniture, although it is not in any way extreme in design, represents the modern ideal in the economical use of cube masses. The right-angle predominates and ornament is inlaid, not imposed. Mr. Brangwyn uses a variety of woods, always to the best advantage, though some of his inlaid patterns would become tiresome to live with. On the whole, his simply-designed, but very pleasing, oak chairs and tables are the most successful pieces, though the wardrobes, sometimes containing a concealed dressing table, and sideboards, are cunningly contrived to hide a multitude of necessary gadgets behind a plain uncompromising front. The 'drawing-room' furniture, occasional tables and glass-fronted cabinets, are more fantastic in idea and not so satisfactory.

All the pottery, made by the Royal Doulton Potteries and the Ashted Potteries, is very pleasing in pattern and colour, and has the advantage of being inexpensive. Donegal Handtuft rugs are beautiful, but the larger carpets are covered with rather overwhelming patterns.

Fellows of the Society, in view of its primary interest in the Industrial Arts, should make a point of visiting this exhibition and observing for themselves Messrs. Pollard's very interesting experiment in asking a great artist to express the forms of their activities through an artist's mind.

A National Theatre.—Mr. Geoffrey Whitworth has written an essay, which Messrs. Gollancz have published in book form, called "The Theatre of my Heart," and it should be read by everyone who has ever enjoyed going to the theatre.

Mr. Whitworth is the founder of the British Drama League; both he and the League are working for the foundation of a National Theatre, and in his book Mr. Whitworth explains why a National Theatre is to him, and must be to everyone to whom the art of the theatre makes the slightest appeal, the "theatre of my heart."

The essay is written with a gaiety of style that helps to make Mr. Whitworth's plea the more profoundly convincing, and it is impossible to read it without sharing his opinion that a National Theatre is in every way as necessary to a nation as a National Picture Gallery, or a National Library or Museum. The author does not deal here with ways and means, which are not necessarily the concern of the theatre-going public, though he does indicate the existence of carefully worked-out schemes, but he shows far more convincingly than by columns of figures or technical details that the building of a National Theatre is not a fantastic dream of what he calls "fluffy idealism," but a practical proposition.

Mr. Granville Barker has set forth all the practical considerations and illuminated the subject as no one else could in his recently published pamphlet, "A National Theatre." In this he gives a list of those who responded to a circular letter sent out by the Drama League. He describes this list as a mixed bag, but it is a list of notable names that should make any further hesitancy impossible.

To return to Mr. Geoffrey Whitworth's delightful little book, we may quote his last words :—

"If in this little essay I have seemed to base the argument on claims too visionary and on theories too romantic, that is because I am persuaded that no ordinary considerations can suffice to move the mountain of inertia which stands in our way and which has somehow or other to be swept aside. The appeal to self-interest—so powerful in most matters of public concern—is here ruled out of court by the very nature of the case. Nevertheless there are occasions—are there not?—when a moral value can be envisaged as its own reward, and when the perfect is seen to be in its own right the most truly practical thing in the world."

NOTICES

OPENING OF THE 177th SESSION

The programme of Meetings for the forthcoming Session is now in the course of preparation and the Prospectus will be issued to Fellows during the last week in October. The opening meeting of the session will be held at 8.30 p.m. on Wednesday, November 5th, when the Inaugural Address will be delivered by SIR EDWARD GAIT, K.C.S.I., C.I.E., Chairman of the Council. The subject of the Address will be "Britain's Record in India."

After the delivery of the Address, the Society's silver medals awarded for papers read last session will be presented.

*THOMAS GRAY MEMORIAL TRUST*PRIZES FOR THE IMPROVEMENT AND ENCOURAGEMENT
OF NAVIGATION

Under the will of the late Thomas L. Gray the Royal Society of Arts has been appointed residuary legatee of his estate for the purpose of founding a memorial to his father, the late Thomas Gray, C.B., who was for many years Assistant Secretary to the Board of Trade (Marine Department).

The objects of the Trust are "The advancement of the Science of Navigation and the Scientific and educational interests of the British Mercantile Marine."

The Council offer the following Prizes :—

I.—PRIZE FOR AN INVENTION

A Prize of £100 to any person who may bring to their notice a valuable improvement in the Science or Practice of Navigation proposed or invented by himself in the years 1929 and 1930.

In the event of more than one such improvement being approved, the Council reserve the right of dividing the amount into two or more prizes at their discretion. Competitors must forward their proofs of claim on or before December 31st, 1930, to the Secretary, Royal Society of Arts, John Street, Adelphi, W.C.2.

II.—PRIZE FOR AN ESSAY

A Prize of £100 for an essay on the following subject :—

"The Training of Apprentices and Cadets with a view to their becoming efficient Officers in the Merchant Service."

Competitors must send in their essays not later than December 31st, 1930, to the Secretary, Royal Society of Arts, at the above address.

The essays must be typed or clearly written. They must be sent in under a motto, accompanied by a sealed envelope enclosing the author's name, which must on no account be written on the essay. A breach of this regulation will result in disqualification.

The Judges will be appointed by the Council.

The Council reserve the right of withholding the Prize or of awarding a smaller Prize or Prizes, if in the opinion of the Judges no suitable invention or essay is submitted.

The Council also reserve an option on the copyright of the successful essay.

UNEMPLOYMENT.*

By HENRY CLAY, M.A., M.Com.

The problem of unemployment is the subject of an extensive and growing literature; selection is necessary to bring the subject within the compass of a single lecture. The problem is also the field of a great deal of political activity, and is inevitably, therefore, controversial. I propose to avoid unnecessary controversy, and to bring the subject within possible limits by selecting for treatment one aspect only—the contrast between the pre-war problem and the problem as it has faced the country since the war. The analysis of the experience of the last two generations had already before the war elucidated certain elements, which it is possible to set forth without inviting controversy. The chief distinctive elements in the post-war problem are revealed by contrast in their broad outlines; and this contrast itself suggests certain explanations of the change. It is possible, moreover, to restrict the discussion very largely to elements of which there is a statistical measure; this should serve to check the bias to which the most scientific investigator may be liable in approaching a subject so closely connected with contemporary political controversy.

Pre-war study, culminating in the reports of the Royal Commission on the Poor Laws in 1909, revealed the problem as a problem of industrial organisation and not one merely of personal defect. Personal defect might determine which workers should be unemployed, but unemployment was inevitable for some. It revealed it again as a problem of adjusting the supply of labour to a fluctuating and changing demand. Population grew and was absorbed in industry without causing any increase in the average percentage of unemployment. Industries declined and new industries grew up, the one without apparently permanently increasing unemployment, the other without permanently relieving it. With this indication of the general nature of the problem, we can turn to the elements in it revealed by analysis.

* Paper read at the Royal Institution of Great Britain on June 13th, 1930.

Two elements were easily distinguished. Seasonal unemployment, due to fluctuations in the conditions of work, as in building, or the demand for the products of industry, as in the gas industry, could be isolated and measured. Equally clear was the special problem constituted by the chronic under-employment of industries in which work fluctuated daily and the engagement of labour was by the day or half-day for the job. Casual work of this kind attracted and held reserves of labour far in excess of the maximum requirements of the industry, and led to a spreading of work over an excessive number of under-employed workers.

A third element was the inevitable time-lag in the movement of labour from one job to another. A large part of the demand for labour is made up of a collection of discontinuous pieces of work ; even if the aggregate demand remains unchanged it does not follow that the labour displaced by the termination of one job will be able immediately to find and fit itself into the new job. This would be the case even if there were no change in the direction of the country's activities ; in fact there is constant change. Even before the war industries were constantly declining and employment maintained only by the compensating expansion of new industries. Inevitably there was some loss of time, some unemployment involved in this continuous transfer of the working population from jobs that had terminated, or industries that were declining, to new jobs and new industries, often in new districts.

Finally there was distinguished the most important element, and at the same time the most difficult to explain, in the continual fluctuations in the general activity of industry as a whole. This can be illustrated best by statistics of prices and employment ; but all the indices of economic activity that we possess exhibit similar, and, if we confine our attention to yearly figures, roughly synchronous variations. This so-called cyclical fluctuation of industry, carrying with it an alternation of expansion and contraction in the demand for labour, has been the subject of very extensive research, and economists are not yet agreed on its exact nature and causation. Certain features of it are, however, sufficiently established to permit a summary that will serve our present limited purpose of comparing pre-war and post-war conditions.

The phenomenon is obviously connected with the fact that industry as a whole, since production processes are so lengthy and complicated, is carried on ahead of demand, and necessarily therefore on an estimate of demand. Trade fluctuations represent the errors in estimate and anticipation of the entrepreneurs, who take the risks, and exercise the direction, of industry. Over-production, it must be understood, does not mean production of more than can be consumed, or even of more than can be sold at a price. It means production of more than can be sold at the price *anticipated*, when production was undertaken. Since the costs incurred were based on this anticipation, failure to realise the anticipated price involves the entrepreneur in loss, and leads him to check further production. This check reduces the incomes of the workers and others dependent on him, so that losses in one industry tend to transmit their effect to other industries.

This tendency of mistakes in anticipation to lead to check, and so to a spreading of unemployment, is enhanced by a circumstance that a finer analysis of trade statistics brings out. While prices, wages, interest rates and other factors, if annual figures are studied, all seem to fluctuate together, on a closer examination it is seen that wages and certain other costs of industry tend to lag behind prices. On a rising market, therefore, the margin of profit accruing to the entrepreneur will tend to widen, and so to stimulate him to increase output ; on a falling market, costs will persist on a relatively high level and involve him in losses, thus leading him to curtail production. Now a rising market never rises indefinitely ; the root cause for this is probably that industry tends—naturally since profits are being made—to increase production in good times without diversifying it ; presently output of most products reaches a point at which demand is satiated, merely because consumers have now all they want of these products. A fall in prices is inevitable when this stage is reached, and with it a check to further production.

One aspect of these fluctuations that has been made much more intelligible by recent enquiry is the influence of credit policy. When trade is expanding there must be an expansion in the total available means of payment, or increased sales in one industry would merely divert purchasing resources from other industries, which would thereby contract and cancel the effect of expansion in the prosperous industry. Such additional increase of payment can, however, be provided by a more rapid turnover of bank deposits and cash, and by an expansion of bank advances. Banks must, however, have regard to their cash reserve ; there is therefore a limit, elastic but still a limit, to the expansion of advances. When this is reached there is a check to further expansion of production and trade except at a lower level of prices. This necessity of watching their reserve rates is an automatic and ever present inducement to banks to scrutinise carefully applications for advances, and to check the expansion of credit merely for purposes of socially unnecessary speculation.

We have seen how a boom is checked ; how does industry recover from a general depression ? Before the war there was only one way—by restoring a positive margin between costs and receipts, in other words, by getting costs down, as prices have come down. This was achieved by the bankruptcy of the less efficient concerns, the reduction of wages, removal of financial charges by liquidation and re-organisation, and general improvement in efficiency. It was helped by the tendency of prices to rise as stocks of commodities were reduced, and consumers' demands revived again.

Let us turn to the post-war period. All the elements in the problem that were distinguished in the pre-war period are still present. Seasonal fluctuations of course persist, and little progress, if any, has been made in dove-tailing seasonal jobs. Casual employment persists ; one of the most discouraging features of recent years has been the fact that in certain industries, in which since 1919 there has been a great expansion of employment, there has been a corresponding expansion also in the number of workers employed ; in building and docks more

particularly the methods of recruiting and engaging labour are such that, although the demand for labour has expanded sufficiently to employ a greater number of workers than were seeking employment in these industries then, so many have been drawn in that there are now more unemployed. The loss of employment involved in the shift of labour from job to job has probably increased, because there has been a pronounced shift of industrial activity to new trades and new districts. Finally, general fluctuations have recurred—to a peak in 1920 and another minor peak in 1924—amplier in scale, but superficially similar in character, when compared with pre-war fluctuations.

When, however, we plot out the figures of unemployment and compare them with pre-war figures, a marked difference appears. Not only is the average of unemployment higher, but the fluctuations appear to take place above a minimum, which is much higher than the pre-war minimum. Apart from fluctuations, there appears to be a residual problem of unemployment to-day, represented by perhaps eight per cent. of the insured population as compared with two or three per cent. before the war. And the post-war depression has persisted in a way that we can parallel in pre-war years only by going back to the seventies and eighties of the last century. It is this peculiar and disturbing feature of the post-war problem that I propose to examine in the time that remains at my disposal.

In our analysis of the pre-war problem we saw that, quite apart from seasonal and cyclical fluctuations, a certain amount of unemployment was continuously caused by the necessity of transferring labour from declining to expanding industries, in the course of the continuous adjustment of industry to changing needs and conditions, by which the employment of the working population as a whole was maintained. If in the post-war period there is an undisturbed mass of unemployment, underlying all fluctuations, it must be either that the need of adjustment on the part of industry is greater, or that the capacity to adjust itself to changed needs and conditions is less; or that both these conditions are present. We saw also that recovery from a general depression was effected by a reduction in costs relative to receipts, which restored a profitable margin on industrial enterprise, and so made resumed expansion possible. It may be that the persistence of a great mass of unemployment may be due to an inability in the post-war period to get costs down in this way. We will examine these two possible explanations in turn. That the need of adjustment to changed conditions is far greater than before the war follows necessarily from the war itself. By interrupting established trade relations the war created a new commercial situation to which this country had to adjust itself. More particularly the interruption of British exports led to the development of competitive industries in many of our markets, and the nationalist feeling which the war excited has led to the preservation of these industries by protection. Another effect of the war was to expand all the industries that directly or indirectly subserved the demand for munitions. A reverse process of contraction had to take place before employment could be normal again. Even if the war had not had this dislocating effect, the war and the post-war boom, by

the apparent prosperity they created by inflating credit, rendered it unnecessary for industry to adjust itself to the changes—in technique, in consumption, in competition—which were taking place, and would have taken place if there had been no war. Thus industry at the end of the boom had suddenly to face the results of six years' cumulative change all at once, and to attempt an adjustment which is not yet complete.

Marked progress was made in this re-adjustment in the year immediately following the collapse of prosperity in 1921. The munitions industries were effectively demobilised, and reduced to a size normal in relation to peace demands, by 1924. But since then industry has been less successful. With slight fluctuations unemployment has persisted, until to-day it is worse than at any period since 1921. Industry has not lost the capacity of adjustment and expansion. On the whole the annual increase in the working population has been absorbed. But no impression has been made on the residual mass of unemployment. It is necessary once again to select from among the many influences that retard recovery and provide an explanation of this persistence. I shall confine myself to three influences.

Recovery, we saw, comes from depression, when costs are brought down relatively to selling prices, and it becomes worth the while of the persons who direct industry once again to expand production. It is the relative and divergent movement of costs and selling prices, first in favour of the entrepreneur and then against him, that explains fluctuations. But prices as a whole may be subject to a secular trend, upwards or downwards; as they fell from 1873 to 1896, rose from 1896 to 1920, and fell from 1920 to the present time. Such a general movement, coupled with the tendency of certain prices (e.g. the price of labour) to lag after other prices, very much assists, or alternatively obstructs, recovery from a depression. If the trend of prices in general is upwards, recovery is rapid. When on the other hand it is downwards as it has been since 1920, and more particularly since 1924, the entrepreneur is constantly chasing a profit without being able to realise it; as quickly as he effects economies in production, a further fall in prices, acting with wages and interest charges that are sticky and do not come down, cancels all his work. A principal cause of the prolonged depression must be the fall in the world price level of commodities.

This fall is generally attributed to the return to the Gold Standard in 1925, and a restriction of credit since then in defence of the country's gold reserve. It is not certain that the increase in gold supplies since 1925 has not in itself been adequate to sustain a price-level that did not fall; but two influences have operated to make it inadequate. The first is the absorption of vast quantities of gold by India, where it was used for consumption purposes and did not influence prices, and by America and France, where it was sterilised and not allowed to exert the influence that before the war it would have exerted, on credit, and through credit on prices. The other is the drain of funds to New York for the purpose of Stock speculation, which compelled other monetary centres to maintain

relatively high Bank Rates in order to retain funds, and led ultimately to a Stock Exchange collapse, which set back trade generally. Another influence has been the over-production of certain commodities with a wide influence in world markets, such as coffee, wheat, rubber, coal. Any general recovery of trade is unlikely so long as commodity prices continue to fall.

There is evidence, however, that the capacity of industry to adjust itself to a lower price-level is less than before the war; and, generally, that industry has grown more rigid and less adaptable at a time when the need for elasticity and re-adjustment is greater than ever. This may be illustrated by comparing the movement of prices in general with wages; while wholesale prices have fallen 25 per cent., wages have fallen only $1\frac{3}{4}$ per cent. With wages may be considered social services, the cost of which has increased while prices have been falling; no attempt has been made to adjust rates of benefit and pensions to the reduction in the cost of living. Again, debt charges remain on the 1924, or even on the pre-1920 level, where they have not been reduced by liquidation or reconstruction. Industry, therefore, gets little assistance from labour or the Government in its attempt to bring its costs down in accordance with the general reduction in prices, and the process of rationalisation, in which it is now engaged, is the last attempt to reduce costs, already considerably reduced, without such assistance.

The final influence that I wish to mention has reference particularly to the development of new industries to compensate for the decline of old industries. This is a process which was normal before the war, and is more necessary now in proportion as the decline of old industries, under the shock of war dislocation, is greater than before the war. Now expansion in this country takes place less as the result of the establishment of entirely new firms to exploit new processes and new demands, than as a result of existing firms, which are making profits by the efficiency of their management, applying these profits to finance expansion in new directions. Even within a declining industry there will always be firms making profits in specialities, which are expanding out of these profits, and so providing some compensation for the decline in the rest of the industry. Before the war the profits, so applied, were subject to a deduction of at most 1s. 2d. in the £; to-day, in large private firms or private limited companies, where the proprietors' share of profits are subject to sur-tax as well as income tax, the rate of deduction may be 7s. or 8s. in the £. The country is saving a smaller proportion of its income each year than before the war; this, however, is a minor obstacle to recovery compared with the heavy taxation of that part of income which is applied directly and most effectively to expanding industry in new and profitable directions. The proceeds of this taxation are needed to pay interest on the National Debt and to finance extended social services. In this transfer from financing industrial development to financing consumption may be found, in part at any rate, the explanation of prosperity in the luxury industries at a time of unprecedented trade depression.

boom, by

EXHIBITION OF MODERN FURNITURE

MODERN TENDENCIES IN FURNISHING. Mansard Gallery, Tottenham Court Road.
Till October 31st.

This is a good modest exhibition, at which nothing more violently futurist is shown than a rustless nickel table and some chromium-plated steel chairs. These are very attractive, but they would be difficult to adjust to any room not entirely fitted out on the same lines. On the other hand the simple glass dressing tables, twentieth century though they be, could fraternise perfectly well with a four-poster and an oak chest, or anything good of any period. They would no doubt be specially agreeable in small bedrooms, where owing to their transparence they would give the illusion of saving space.

Mr. Heal has again proved how ingenious he is ; though our ancestors, we must remember, were no less cunning in inventing secret drawers than our contemporaries are, and, at their best, unsurpassable craftsmen. Mr. Heal's writing desks are superbly contrived, altogether efficient, even with accommodation for a telephone apparatus—nearly always so tiresomely in the way. Perhaps the most interesting desk is the one made to fit into the angle of a room. This, like much else, is in weathered oak, which appears nowadays to be to the taste of many people. It is permissible to wonder at the vogue for furniture with this curious albino look.

A cupboard in palisander wood deserves inspection. The low walnut dressing tables express a sympathetic fantasy, though again there is nothing particularly modern about them. The carpets and rugs are modern enough ; and it is worth noting that good, sensible designs are being carried out more or less all over Europe : for instance, two of the pleasantest rugs come respectively from Donegal and Czechoslovakia. The same applies to hangings ; there is a charming green curtain from Germany—but this is a department in which English goods are unexcelled.

Electric light fittings are a problem. It seems easy to give them a modern appearance, but the shapes they are made to take are mostly the worse for being so untraditional. Classic and Gothic forms of beauty seem to correspond to the requirements of two main human æsthetic dispositions. We must not yet judge the new style, but we cannot admit the superior efficiency of all this queer Euclidian glass ; perhaps it is justified by its spiritual affinity to the kinds of decoration for which it is intended, which in their turn have a genuine structural basis.

P. B.

MEETINGS OF OTHER SOCIETIES
DURING THE ENSUING WEEK

MONDAY, OCTOBER 20.—Birth Control Racial Progress, Society for Constructive, at the Grotian (Steinway) Hall, Wigmore Street, W. 8.30 p.m. Annual Meeting. Dr. Marie Stopes, "The Triple Triumph of our Year."
"Technical Engineers, Institution of, Storey's Gate, 6 p.m. (Graduates' Section.) Mr. A. E. ... production of Tin Containers."

University of London, at the Imperial College of Science and Technology, South Kensington, S.W. 5.30 p.m. Prof. K. Freudenberg, "Some Aspects on the Structure of Cellulose and other Polysaccharides ; with remarks on the Constitution of Lignine." (Lecture I.)
At King's College, Strand, W.C. 5.30 p.m. Miss E. Fogerty, "A Recital from the Testament of Beauty."
5.30 p.m. Prof. R. W. Seton-Watson, "The History of Serbia. Lecture II—The Coming of the Turks."
At the London School of Economics, Aldwych, W.C. 4.30 p.m. M. Paul Vacher, "Political Parties in France, 1814-1880."
At the School of Oriental Studies, Finsbury Circus,

E.C. 4.30 p.m. Prof. H. H. Dodwell, "The Historical Geography of India." (Lecture II.)
At University College, Gower Street, W.C. 5 p.m.
Dr. H. P. Gilding, "The Reticulo-Endothelial System." (Lecture II.)
5.30 p.m. Mr. W. N. Weech, "More Roman Towns in North Africa."

TUESDAY, OCTOBER 21. Junior Institution of Engineers, at the Chamber of Commerce, New Street, Birmingham. 7.15 p.m. Presidential Address by Dr. D. S. Anderson.

Transport, Institute of, at the Institution of Electrical Engineers, Victoria Embankment, W.C. 6 p.m.
Mr. J. A. A. Pickard, "Accident Prevention."

University of London, at the Imperial College of Science and Technology, South Kensington, S.W. 5.30 p.m.
Prof. K. Freudenberg, "Some Aspects on the Structure of Cellulose and other Polysaccharides; with remarks on the Constitution of Lignines." (Lecture II.)
At King's College, Strand, W.C. 5 p.m. Dr. J. W. Pickering, "Blood Plasma and Platelets." (Lecture III.)

5.30 p.m. Prof. Sir B. Pares, "Contemporary Russia. Lecture III—End of Alexander II."

5.30 p.m. Mr. T. G. Rose, "Management. Lecture I—Its Theories."

At the London School of Economics, Aldwych, W.C. 5 p.m. Mr. C. A. W. Manning, "International Relations as a Subject for University Study."

At University College, Gower Street, W.C. 5.30 p.m. Prof. T. E. Gregory, "Newmarch and his Contemporaries." (Lecture I.)

Zoological Society, Regent's Park, N.W. 5.30 p.m. Scientific Business Meeting.

WEDNESDAY, OCTOBER 22. British Science Guild, at the University of Liverpool. 5.30 p.m. Lt.-Col. Sir David Prain, "Science Discipline."

Fuel, Institute of, at the Incorporated Accountants' Hall, Victoria Embankment, W.C. 11 a.m. Presidential Address by Sir David Milne-Watson.
2.15 p.m. (1) Mr. J. Lubbock, "The Industrial Uses of Fuel Oil." (2) Dr. E. W. Smith, "The Use of Coke Breeze for Industrial Purposes."

Literature, Royal Society of, 2 Bloomsbury Square, W. 5.15 p.m. Mr. T. S. Eliot, "The Place of Pater."

Public Health, Royal Institute of, 37 Russell Square, W.C. 4 p.m. Prof. Dr. W. S. Lazarus-Barlow, "The Prevention of Pre-Cancerous States and the Arrest of Cancer."

University of London, at the Imperial College of Science and Technology, South Kensington, S.W. 5.30 p.m. Prof. K. Freudenberg, "Researches on the Constitution of Insuline."

At King's College, Strand, W.C. 5.30 p.m. The Rt. Hon. Lord Atkin, "Professions and Careers. Lecture III—Law."

5.30 p.m. Mr. D. S. Mirsky, "Russian Literature in its Relation to Russian Social History (1740-1860). Lecture II—The Eighteenth Century."

At the London School of Economics, Aldwych, W.C. 5 p.m. Mr. R. S. T. Chorley, "The Conflict of Law and Commerce."

6 p.m. "Office Machinery." (Lecture III.)

At University College, Gower Street, W.C. 5.30 p.m. Prof. C. K. Allen, "Legal Duties." (Lecture II.)

5.30 p.m. Mr. J. H. Helweg, "Danish Castles and Manor Houses." (Lecture II.)

THURSDAY, OCTOBER 23. Aeronautical Society, at the Royal Society of Arts, Adelphi, W.C. 6.30 p.m. Mr. F. W. Meredith, "Air Transport in Fog."

Antiquaries Society of, Burlington House, W. 8.30 p.m.

Chemical Society, Burlington House, W. 8 p.m.

Mr. A. W. Chapman, "Dynamic Isomerism involving Mobile Hydrocarbon Radicals. Part II—The Intramolecular Character of the Amidine Rearrangement."

Messrs. A. W. Chapman and C. H. Perrott, "Dynamic Isomerism involving Mobile Hydrocarbon Radicals. Part III—Some effects of Substitution on the Velocity

of Interchange and Position of Equilibrium of Isomeric Triarylbenzyl-amidines." Messrs. G. G. Davies, I. M. Heilbron and W. M. Owens, "The Unsataponifiable Matter from the Oils of Elasmobranch Fish. Part VII—The Synthesis of α -glyceryl Ethers and the Constitution of Batyl, Salachyl and Chimyl Alcohols." Messrs. I. M. Heilbron and D. G. Wilkinson, "The Unsataponifiable Matter from the Oils of Elasmobranch Fish. Part VIII—The Structure of the Naphthalene Hydrocarbon derived from Squalene." Messrs. I. M. Heilbron and F. S. Spring, "Studies in the Sterol Group. Part X—Hydrocarbons of the Ergosterol Series and the Nuclear Structure of Ergosterol." Miss N. I. Fisher and Miss F. M. Hamer, "A General Method for the Preparation of Thiocyanine Dyes. Some Simple Thiocarbocyanines."

Electrical Engineers, The Institution of, Savoy Place, W.C. 6 p.m. Inaugural Address by the President (Mr. C. C. Paterson).

Fuel, Institute of, at the Incorporated Accountants' Hall, Victoria Embankment, W.C. 10.45 a.m. and 2.15 p.m. Symposium on "Fuel Problems in the Mercantile Marine. Papers by Mr. Sierry B. Freeman, Dr. W. W. M. Meijer, Mr. W. J. Muller and Mr. W. L. Roxburgh; and a general collective report by Engineer Vice-Admiral Sir Robert B. Dixon and Major W. Gregson.

Linnean Society, Burlington House, W. 5 p.m.

Mechanical Engineers, Institution of, in the new University Buildings, Nottingham. 6 p.m. Address by the Chairman of the Branch, Mr. G. W. Wooliscroft, on "The Training of an Engineer."

At Queen's Hotel, Birmingham. 6.30 p.m. Mr. W. F. A. Richey, "Modern Lighthouse Apparatus and Fog Signals."

University of London, at Bedford College for Women, Regent's Park, N.W. 5.15 p.m. Miss L. Grier, "Changes in Occupations and Leisure of Women from 1830 to 1930."

At King's College, Strand, W.C. 5 p.m. Dr. J. A. Hewitt, "The Metabolism of Carbohydrates and Fats." (Lecture II.)

5.15 p.m. Dr. A. D. Lindsay, "Social and Political Ideas of some Representative Thinkers of the Age of Reaction and Reconstruction. Lecture III—Hegel and the German Idealists."

At the London School of Economics, Aldwych, W.C. 5 p.m. Dr. L. T. Hogben, "Some Biological Aspects of Population."

At University College, Gower Street, W.C. 5 p.m. Prof. E. A. Gardner, "Greek Myths and their Representation in Art." (Lecture II.)

5.30 p.m. Dr. A. M. Bassani, "Francesco Guicciardini."

FRIDAY, OCTOBER 24. Historical Society, at Bec School, Beecherfield Road, Upper Tooting, S.W. 8 p.m. Mr. C. H. K. Marten, "The American Revolution."

Junior Institution of Engineers, 39 Victoria Street, S.W. 7.30 p.m. Mr. A. P. Morris, "Bitumen Emulsions, with particular reference to their use on Indian Roads."

Mechanical Engineers, Institution of, Storey's Gate, S.W. 8.30 p.m. Discussion on "What are the Desirable Objectives of the Age of Power?"—introduced by Mr. J. L. Hodgson.

North East Coast Institution of Engineers and Shipbuilders, Bolbec Hall, Newcastle-on-Tyne. 6 p.m. Annual General Meeting. Presidential Address by Mr. J. McGovern.

University of London, at King's College, Strand, W.C. 5.30 p.m. Prof. J. Dover-Wilson, "Shakespearean Comedy: some Observations of an Editor."

At the London School of Economics, Aldwych, W.C. 2.30 p.m. Dr. W. Rose, "German Life and Literature from 1770 (with special reference to the Life and Works of Goethe)." (Lecture II.)

At University College, Gower Street, W.C. 5.30 p.m. Prof. A. Penck, "The Relations of Europe and Central Asia." (Lecture I.)

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No. 4066

FRIDAY, OCTOBER 24th, 1930

VOL. LXXVIII

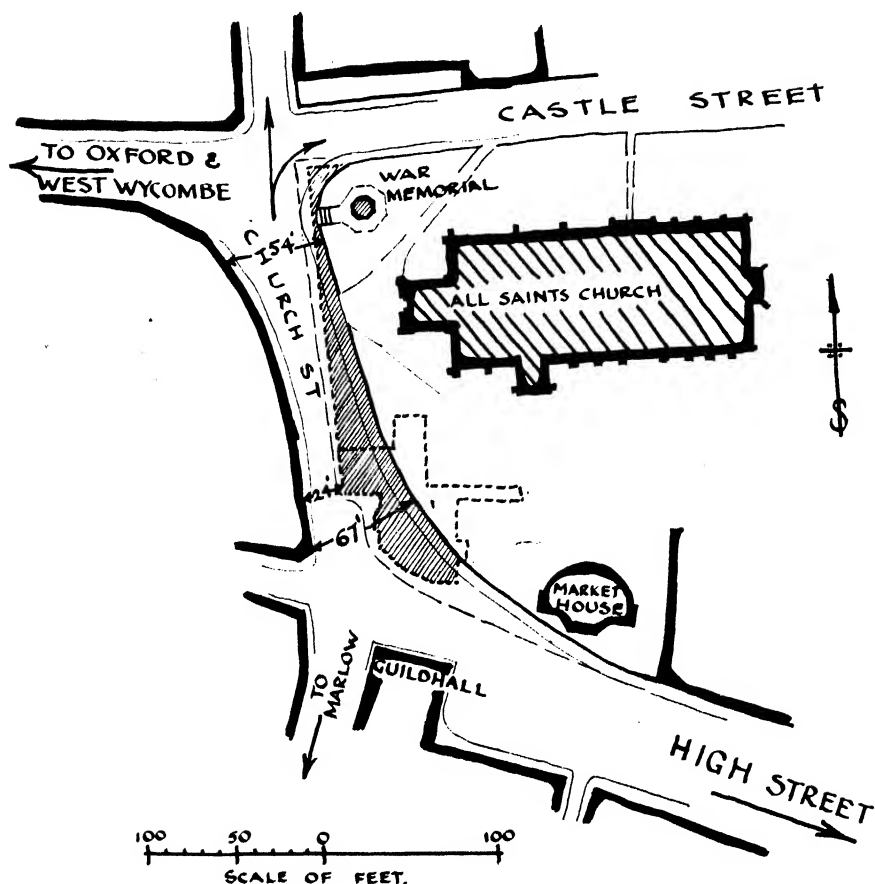
*All Communications for the Society should be addressed to the Secretary, John Street,
Adelphi, W.C.2.*

NOTES OF THE WEEK

"Public opinion on a wide scale must be educated and won if the goal is to be reached. We must teach in season and out the deadliness and essential irreligion of dirt, disorder and ugliness; we must show the possibility of clearer visions of God as with eager eyes we look not only through the avenues of truth and goodness, but also through those of beauty."

The Very Reverend Hewlett Johnson, D.D., B.Sc., Dean of Manchester.

High Wycombe.—Our attention has only just been called to a leader in the *Bucks Free Press* on the Note in the *Journal* of October 3rd in reference to the suggested bypassing of High Wycombe and West Wycombe. We regret to hear that the information published by the London evening paper referred to in reference to the prosperity of High Wycombe was incorrect, and that this town is suffering from trade depression like other towns. We are also informed that there is no abandonment of the scheme for widening in the centre of High Wycombe and the curtailment of the churchyard in consequence, that the Ministry has granted an Order for the work to proceed and that the usual steps are being taken to deal with owners of property involved. We are glad to note that this *Journal* has "hit the nail on the head" in regard to the absolute necessity for a bypass. We hope the *Bucks Free Press* speaks with authority and real conviction. If so, they should press for the saving of the ratepayers' money by the abandonment of the plan for the wasteful nibbling off of a corner of the churchyard, which will have no real effect upon the traffic and only create an eyesore in place of a very characteristic piece of High Wycombe. The suggestion that the Royal Society of Arts is not anxious to have a constant stream of traffic through West Wycombe Village is not relevant. It must be clear to anyone motoring between London and Oxford who observes



the daily increase of traffic that something must happen at West Wycombe whoever owns it. Either it must be bypassed or the Local Authorities must do something to widen the village street, which would seem to be impossible after all that has been said about its charms. We repeat Mr. Clough Williams Ellis's eloquent reference to West Wycombe at the annual dinner of the High Wycombe Furniture Manufacturers' Federation, which we quoted in a former issue :—" Of course, West Wycombe is a great gem ; I do think for your own sakes you should give this enterprise of the Royal Society of Arts all the support you can, because it is going to be a great shrine of pilgrimage. People from all over the world will come because there are very few things left in that condition." Is it not time that there was really some clear thinking on the subject, and, if there is a town planning Committee in Buckinghamshire, that they advise as to the best way of making a direct road from a point the London side of High Wycombe to the main road to

Oxford beyond West Wycombe. Here is a chance to employ labour on a really urgent piece of work which should be carefully planned, including the necessary trees, so that the road can be a credit to the County. The scheme which the High Wycombe Town Council considered some years ago, and which is spoken of as "substantially endorsed," would not appear to help matters. If the Council are prepared to sacrifice their Corn Market and the Guildhall, there really is nothing more to be said, and all the fine words about West Wycombe and its preservation have no meaning. This is the kind of problem which it is becoming increasingly necessary to face in connection with all our mediaeval towns, and we implore High Wycombe to take a lead in settling this serious problem with unsophisticated enlightenment. The village of West Wycombe was purchased by the Royal Society of Arts in March, 1929, and there is no difficulty in proceeding with its restoration if the Chepping Wycombe Council will provide the necessary drainage and water facilities (they are committed to this as a part of a grant from the Ministry), which the R.S.A. has done everything in their power to urge them to do. Practically the whole press of England was eloquent in regard to the Society's action in acquiring the village. The booklet which was produced emphasised this. There would appear to be no possible way of avoiding the destruction of the village except by a bypass, which obviously should start on the London side of High Wycombe, skirting the town and village, and to the infinite advantage of the residents of both places.

The Advertisers' Slogan.—Sir Charles Higham has addressed a letter to all the principal newspapers urging the public to buy advertised goods on the assumption that the advertisement is a guarantee of their quality. Are we therefore to take for granted that they are necessarily better than those of the smaller man who has not the means to advertise? It is an accepted fact that intermittent advertising is of very little value, and it is on this score that the small man is handicapped although his wares are possibly of equal, and perhaps better, quality than similar ones which are largely advertised. We are sure that advertising agents of repute take the greatest precautions to make all necessary enquiries as to the quality of the goods they advertise, and therefore there is something in Sir Charles's observations that if the buyer purchases an advertised article he has reason to suppose that it conforms to a certain standard. But it is not correct to assume that all "unnamed, unknown and unadvertised" goods are necessarily foreign. Sir Charles is naturally concerned lest the present trade depression should result in a falling off of advertising contracts, and desires to make it clear that, in his opinion, this will be fatal to increased business. Advertising is, of course, psychological, and a firm that ceases to advertise after familiarising the public with its existence, must necessarily sustain considerable loss. Surely this is an opportunity for Sir Charles to suggest to his clients not only the importance of keeping up their advertisements, but also of reconsidering the manner of them, apart from the newspapers, by a more studied and subtle form of advertising in

public places. The public are tired of blatant and unseemly displays, and the general conflict of shouting advertisements on huge hoardings, pleasant buildings, and beautiful scenery. It should not be necessary to have an Act of Parliament to prevent these vulgar announcements of articles of a certain standard of reputation. Will Sir Charles persuade the firms for whom he acts to see that all external advertising is controlled by some educated representative with an eye for the seemliness of the placing of the posters announcing the merits of their wares? It is admitted that many of those now produced are of very high quality, but surely their distinctive power is destroyed, and their advertising value greatly impaired, if confused with a multitude of other posters of unequal quality. We have heard a great deal about the art of advertising, and turning over the pages of Mr. McKnight Kauffer's book on the subject, we realise even more acutely than hitherto how much real talent has been wasted by this lack of attention to the setting of the advertisement, and how much the billsticker has been responsible for this unfortunate result.

Village Industries.—The village grocer's shop of to-day is a revelation of its incapacity to be self-supporting. If one lives in the country it ought to be possible to go into a shop in an English village and to buy local produce. But those of us who really love the country, and desire, as far as we are able, to live there and separate ourselves from the sophistications of the town, find we have to send to London to get wholesome produce from the villages. We are surprised to find that the villager, though surrounded by orchards and productive ground, relies almost entirely on tinned produce, and lives from hand to mouth thereon. Mr. Lloyd George, with his genius for coining phrases, has described all this as "the tinnification of the villages." This habit of relying on manufactured food has become so insidious that no one realises that it is possible, with some knowledge of horticulture and reasonable industry, to live all the year round on the produce of a very small area of English soil. A correspondent wants to know where it is possible to get small Cheddar cheeses. An advertisement in an evening paper, headed "Delicious Cheddar Cheese," caught one's eye. It was disappointing to find that these were merely manufactured cheeses in boxes, whereas there seems to be a real demand for the real thing with a crust on it, but made in a smaller size for the consumption of the smaller families of to-day. Another correspondent wants to know why, with all the co-operative milk associations, it is impossible to get Grade "A" milk in his village without sending to London for it and getting it down in bottles. An inspection of the local dairy did not encourage him to get his milk from this source. Some years ago there was a great controversy about the health-giving properties of stone-ground flour, and the medical profession strongly recommended this in preference to the white flour which has now become the staple food of the country. We have read from time to time letters in the papers asking where stone-ground flour can be obtained, and there is clearly a certain

demand for this, but a difficulty in the matter of supply. We know any number of villages which still have water power mills, but observe that the majority of these are derelict or used only spasmodically to grind flour for the use of poultry. On the other hand, we know one or two such mills which are doing a quite appreciable trade; not locally, however, as they have to send their produce some considerable distance. The brick oven still remains in most villages, and it is an ideal way of baking bread. It only requires the local squires and doctors to reiterate their views as to the advantages of home-made bread for this to become again a living industry in most English villages.

Welwyn Conference.—Professor G. M. Trevelyan said “the time was short for calling a halt to the destruction of natural beauty. Everyone interested in the mental and moral qualities of our race must come to the rescue. The destruction of beauty had degraded our national character as much as drinking and gambling, and we were only just beginning to be aware of it.” Mr. G. L. Pepler said “there were now one hundred joint committees of various kinds covering more than a quarter of the country, and of these some forty were clothed with executive powers to prepare statutory schemes. There were also five hundred and seventy-three local authorities that had embarked on nine hundred and six town planning schemes.” During the discussion which followed, emphasis was laid on the importance of propaganda for the purpose of educating the public in the objects of the Council. We could find no reference to the subject of agriculture, the return of which seems to be the only salvation for the countryside. When the countryman has got a real living job again, and lives in the country for his livelihood and not for his recreation, there will be some chance of saving its beauties without Acts of Parliament and town planning Acts.

Art Galleries.

WALKER'S GALLERIES, Bond Street. Mrs. Forrester Wood's silk needlework pictures are on view at Messrs. Walker's till November 5th. They represent landscapes in all parts of the British Isles, and at first sight might be charming though conventional water colours. Their sheen would be the first thing to give them away—itself an agreeable quality. The artist's skill must win everyone's admiration, and no doubt she would not have been able to prove its extent if she had chosen less naturalistic motifs. At the same time one cannot help feeling that the pictures are weak on the æsthetic side just because of this realistic treatment, and one hopes that such a talented and patient artist will find her way to combining a broader manner with the old refinement of execution. She can afford to make the sacrifice.

At the same galleries there is an exhibition of water-colour landscapes by Lady Hume-Williams and Mrs. W. St. John Mildmay, No. 16, Lady Hume-Williams'

Storm Effect, Bellagio, is an impressive little picture : a true water-colour, a fine piece of impressionism and a good pattern. No. 14, *Lake of Geneva*, is nearly as good. Numbers 6 and 7 show sensitive feeling for colour and atmosphere, but are not so impersonally communicated as the two previously mentioned. Mrs. St. John Mildmay's *Agaves in Sunshine*, No. 60, shows the designer's instinct, while No. 72, *Stroudwater*, is one of several pictures by her that will please nearly everyone for their happy compromise with nature.

EXHIBITION OF WORK BY STUDENTS OF THE BOMBAY SCHOOL OF ART. India House, Aldwych.—The Bombay School of Art, founded about the middle of the last century by Sir Jamsetjee Jeejeebhoy, who munificently endowed it, has had encouragement and patronage from prominent citizens of Bombay, governors, and the general public. Its activities comprise not only drawing and painting, but also architecture and crafts—Mr. Lockwood Kipling, father of the novelist, was the School's first director of sculpture.

The present exhibition, in the handsome library of India House, should certainly be visited, not because it includes any very mature works of art, but for the indications it gives of important cultural movements in the Orient. A very long time ago the marriage of east and west produced an important art, the Gandara sculptures. Western influences to-day do not seem to be quite so happy : romantic perspectives make a poor setting for the finely drawn, stylised figures of the Bombay School. On the other hand where students accept European conventions whole-heartedly, their drawing and characterisation are in some cases excellent. Imaginative allegories of Truth, Courage, Patience, and so forth, are as difficult to conceive for an art student in any part of the world as it would be to write an original essay on Spring. The architectural designs and measured drawings reach a high standard of competence.

ALEXANDER WALKER. Water colour drawings and etchings. The Twenty-One Gallery.

The Twenty-One Gallery is showing an Exhibition of water colours and etchings by Alexander Walker. Mr. Walker is a young artist who apparently spends his time quietly painting and etching in his native Essex, oblivious of the upheavals in the Art world caused by the Impressionists, Post-Impressionists, Cubists, Futurists and such turbulent folk. He affects the "fluffy-woolly" manner of the less vigorous and important water colourists of the middle of the last century, and sees rural England through the soft green and sky-blue spectacles of one whose vision is blinded by love of his native countryside. Only in the water colour, *A Gathering Storm* (12) and the etching, *Windswept Firs* (40), does he dare to be free of his ideal of calm trees and sunny skies, and suggest that possibly England does not live perpetually in a mid-Victorian dream of the Golden Age.

Art in England. 1821-1837. BY W. H. WHITLEY. Publishers : Cambridge University Press.

Mr. W. H. Whitley has a fascinating and yet tantalising period for the subject of his book, "Art in England, 1821-1837," which follows his "Art in England, 1800-1837," and his method of handling it is curious and in some ways unsatisfactory. He devotes a chapter to each year of his period, fills it quite impartially with a miscellaneous mass of detail ranging from the scale of payment for figure-models in the Royal Academy Schools to the correspondence leading to the founding of the National Gallery, and leaves it at that ; so that it is rather by reading between the lines than from the actual text that it is possible to gain any general impression of the effect of art upon the period or of the period upon art. It is to Mr. Whitley's credit, however, that this general impression of a period which was ruled over by a king who was enthusiastic in his love of pictures, and which demanded and opened a free National Art Gallery, and yet which received with exuberant praise and proclaimed lastingly great, some of the worst pictures which have so far been painted, is a vivid and lively one.

Mr. Whitley devotes a large amount of space to quotations from the writings of contemporary art critics, and the amazing success of certain pictures which are now considered to be entirely without merit is not so surprising when the standpoint from which they were judged is realised. When a picture was praised first according to its degree of photographic accuracy as a representation of the physical aspect of its subject and next according to the degree of its adherence to the "grandeur of antique form," it is not surprising that Fuseli (whose picture *The Flood*, ten feet by eight in size, was recently sold at Christie's for a guinea) was rated far above Turner, whose pictures aroused as much controversy among his contemporaries as do the sculptures of Mr. Epstein in the popular press of to-day.

The book contains several anecdotes which illustrate George IV's love of pictures, though Mr. Whitley quotes the painter, Haydon, who said of the young Princess (afterwards Queen) Victoria, "She had not much taste for High Art or for high poetry."

The Times, indeed, reported the then Home Secretary, Peel, to have stated that the King, out of his own private funds, purchased the pictures which formed the nucleus of the National Collection, but this statement, though not denied, was incorrect. It is particularly interesting to read of the events which led up to the founding of the National Gallery at a time when there is a renewed feeling for the need of a National Theatre in England, and it is curiously typical that the private collection which was the first to be bought by the State for the Nation, was assembled by a London merchant of Russian extraction named Angerstein.

NOTICES

OPENING OF THE 177th SESSION

The programme of Meetings for the forthcoming Session is now in the course of preparation and the Prospectus, shewing the meetings arranged to date, will be issued to Fellows during the coming week. The opening meeting of the session will be held at 8.30 p.m. on Wednesday, November 5th, when the Inaugural Address will be delivered by SIR EDWARD GAIT, K.C.S.I., C.I.E., Chairman of the Council. The subject of the Address will be "Britain's Record in India."

After the delivery of the Address, the Society's silver medals awarded for papers read last session will be presented.

COUNCIL

A meeting of the Council was held on October 13th. Present :—Sir Edward Gait, K.C.S.I., C.I.E. (in the Chair) ; Dr. Edward F. Armstrong, Ph. D., D.Sc., F.R.S. ; Sir Charles H. Armstrong ; Lord Askwith, K.C.B., K.C., D.L. ; Sir Charles S. Bayley, G.C.I.E., K.C.S.I. ; Mr. Alfred C. Bossom, F.R.I.B.A. ; Sir Felix Brunner, Bt. ; Captain Sir Arthur Clarke, K.B.E. ; Sir William Henry Davison, K.B.E., D.L., M.P. ; Sir Philip Magnus, Bt. ; Mr. John A. Milne, C.B.E. ; Col. Sir Frederic Nathan, K.B.E. ; Sir George Sutton, Bt. ; Mr. James Swinburne, F.R.S., and Mr. Carmichael Thomas, with Mr. G. K. Menzies, M.A., Secretary, and Mr. W. Perry, B.A. (Assistant Secretary).

The following candidates were duly elected Fellows of the Society :—

Allden, John Froude, London.

Armstrong, Mrs. Jane, Eastriggs, near Carlisle.

Baylis, Arthur Noel, B.Sc., Abadan, Persia.

Blake, George Gascoigne, M.I.E.E., F.Inst.P., Richmond, Surrey.

Brennan, Patrick Joseph, Tralee, Ireland.

Cuthbertson-Smith, Donald Andrew, Onitsha, Nigeria.

Dennison, Frederick Adolphus, Bangkok, Siam.

Edwards, C. A. Henry, Lahore, India.

Haigh, Edwin, Barnsley, Yorks.

Hawker, Frank, M.B.E., Handsworth Wood, Birmingham.

Hallewell, George, Keighley, Yorks.

Ichhaporia, N. B., M.A., LL.B., Bhavnagar, Kathiawar, India.

James, Edward Frank Willis, London.

Kharu, Sata L., Srinagar, Kashmir, India.

Lennox, John William, Barry, Glam.

McConnell, John R., Lurgan, Co. Antrim.

Plowman, George T., Cambridge, Mass., U.S.A.

Pritchard, John Craven, London.

Privett, Herbert William, N. Kana, Northern Rhodesia.

Roach, Joseph Frederick, Glasgow.

Rogers, Meyric R., B.A., St. Louis, Mo., U.S.A.

Smith, Captain Sydney, Doncaster, Yorks.

Taylor, Alfred Robert, M.A., London.

Whiting, Frank Edward, F.R.I.B.A., Bideford, Devon.

Williams, Richard James, A.R.C.A., Worcester.

Wynne, Harry, Wallington, Surrey.

Zampetti, Piero Raffaello, London.

Major Sir Humphrey Leggett, D.S.O., R.E., was elected a member of the Council, *vice* Sir Henry A. Miers, F.R.S., resigned.

The Secretary reported the arrangements which had been made for papers and lectures during the forthcoming session.

A Committee was appointed to make recommendations to the Council in regard to suitable subjects for papers and lectures.

The circumstances of a burglary which took place at the Society's House on the night of October 11th were reported.

A quantity of financial and formal business was transacted.

REPORT ON THE SOCIETY'S EXAMINATIONS, 1930.

Once again it is gratifying to report a substantial increase in the total number of papers worked at all the Society's examinations, the figure for this year being 104,245, as compared with 100,696 in 1929.

THE VALUE OF EXAMINATIONS.

For many years it has been the fashion in certain quarters to decry the value of examinations. It is alleged that they are not fair tests, as many candidates, owing to nervousness, are unable to do themselves justice in an examination room. Probably no one will claim that a written examination alone can be an exhaustive test of a candidate's capacities, but up to the present no other system has been devised which is free from faults. The personal interview, advocated by some educationalists, appears to have some of the flaws of the written examination. A candidate who loses his head when faced with an examination paper is not likely to be much less nervous when faced with a live examiner.

Another objection commonly brought against examinations is that they lead to "cramming." "Cramming" is a word that is often misapplied. In all education that is worthy of the name there must be a lot of hard slogging work in which memory plays the principal part. No one, for instance, can learn a language thoroughly unless he has mastered its grammar, and how can this be done except by memory? A glance at the reports of the Examiners which are summarised below will show that in nearly all the examinations in modern languages the complaint is made that grammar and syntax have not been sufficiently studied. A certain number of teachers appear to believe that grammar and syntax can be picked up anyhow, and they will not give their students that severe drill which alone will give them a sound knowledge of these subjects.

It is possible that much of the slipshod method of teaching which we find to-day is due to the popular but fallacious etymology of the word "education." It is

derived, we are often told, from the verb *educere*, which means to draw out what is in the child's mind. It is nothing of the sort. The Romans knew better than to believe that you can draw out of a mind what is not in it. Their word *educare* meant to bring up, rear, educate a child, and was used secondarily of animals and plants, meaning to nourish, support, feed with suitable food, manure, etc. Education, therefore, meant for them supplying the child with food, physical and mental, and not drawing it out of them as if they were spiders who could spin their own webs.

While, however, it should be borne in mind that all hard memory work is not "cramming," one should not for a moment forget that "cramming" does exist, and that it is a very serious evil. More than one examiner complains that from some centres stereotyped answers are received which have evidently been committed to memory and are repeated without proper understanding of them. There is no doubt that teaching will always tend to be modified by examinations, as teachers naturally desire to secure as many successes as possible. In most subjects it is possible to frame questions in such a way as to test the intelligence rather than the memory of a candidate. This point is steadily borne in mind by the Examinations Committee, who are strenuously endeavouring to see that questions of a really educative type are set which will tend to exercise a beneficial influence on the teaching in the schools.

EVENING COMMERCIAL EXAMINATIONS.

The Evening Commercial Examinations were held at three periods, April, May-June and July. In April the number of entries was 31,751, in May 41,054, and in July 19,683. The entries were divided among the three Stages as follows :—

	April.	May-June.	July.	Total.
Advanced Stage ..	3,193	7,023	871	11,087
Intermediate Stage ..	10,544	17,196	6,671	34,411
Elementary Stage ..	18,014	16,835	12,141	46,990

The number of papers worked in the written examinations was 88,000, and in addition 640 candidates presented themselves for the *viva voce* Examinations in Modern Languages.

The subjects of Examination this year were :—

Arithmetic.	Commerce.
English	Railway Law and Practice.
Book-keeping.	Railway Economics.
Shorthand.	Shipping Law and Practice.
Typewriting.	Law and Practice of Marine Insurance.
History.	Stock Exchange Law and Practice.
Economic Geography.	Advertising and Salesmanship.
Economic and Social History.	French.
Economic Theory.	German.
Précis-writing.	Italian.
Commercial Law.	Spanish.
Company Law.	Russian.
Accounting.	Portuguese.
Banking.	Swedish.
Costing.	Danish.
Foreign Exchange.	Dutch.

Statistics.—On page 1239 will be found a Table in which are given for each stage of each subject the numbers of (1) papers worked; (2) first-class certificates; (3) second-class certificates; (4) not passed.

Full reports by the Examiners are published in the various pamphlets containing the Examination papers set in 1930. Teachers and students are strongly recommended to study these.

ARITHMETIC.

Stage I.—The results of the April examinations were good, those of May-June much poorer. As on previous occasions, the examiner points out the importance of making pupils form a rough common-sense estimate of the answer before starting on the solution of a problem. If this were regularly done, we should not get such answers as over £30,000,000 as the price of a carpet; $9\frac{1}{2}d.$ as the price of 1,000,000 lbs. of tea; and $\frac{2}{10}$ ths of an inch as the length of the course for the Schneider Cup.

Stage II.—Here again far too many candidates showed a want of common sense in dealing with the questions, and numerical blunders were more frequent than they ought to be.

Stage III.—The results of the June examinations were distinctly better than usual. There was, however, often confusion between capital outlay and yearly accounts, between stock and sterling, and between present and future value.

ENGLISH.

Stage I.—Although there were few papers of outstanding excellence, the general level of attainment was somewhat higher than in recent years. As a rule the questions on the prescribed books were well answered, but there was a good deal of weakness shown as to the exact meaning of certain groups of words, which led to such sentences as “the cursory language of the prisoner was lurid,” and “the omnivorous monarch was treated with awe.” The letters were in many cases marred by commercial jargon, e.g., “said advertisement.” In spite of all the efforts that are being made to kill it, “Commercial English” takes an unconscionable time to die.

Stage II.—This examination brought out very clearly the difference in the quality of the teaching at various centres. In some the teaching is good; candidates are taught to think for themselves, to express their meaning clearly, and to appreciate what is good in literary works. In others the work shows muddled thought, careless expression, diffuseness or inadequate brevity, and the repetition of memorised answers. The summary proved the most difficult test, and it would appear that more practice in this kind of exercise is needed. It certainly is a valuable intellectual training. In the April papers the answers on the prescribed books were generally poor. Macbeth was confused with Shylock, or described as the murderer of Cæsar. Wireless was responsible for many Aerials, and, according to one candidate, Caliban was “a viscous monster.”

Stage III.—The differences in the teaching in various schools, already commented on, were even more marked here than in Stage II. Thus, in one batch of 13 candidates 10 failed, and the other three only just passed. The work, on the whole, was fairly satisfactory, but the Examiner has to call attention to one or two cases of execrably bad handwriting.

BOOK-KEEPING.

Stage I.—The Examiner reports that the chief faults found in the papers worked at this stage were that the Ledger Accounts and Cash Book were left unbalanced; that the sequence of items in the Balance Sheet was ignored, and that the alignment of figures was often bad, which was responsible for many errors, and frequently

resulted in a candidate being unable to complete an exercise which might otherwise have been good.

Stage II.—The question dealing with Fixed and Floating Assets puzzled many candidates, who evidently had no knowledge of the meaning of the terms. Some even stated that the only persons having Floating Assets were steamship and barge owners. The question dealing with Goodwill also gave some trouble; many candidates while showing some knowledge of the subject, were unable to express it adequately. The exercises, on the whole, were fairly well answered, but any item at all out of the ordinary caused trouble. It is of the greatest importance that candidates should read the questions carefully and thoroughly understand what is asked of them before beginning their answer. Failure to do this leads to a great amount of trouble.

Stage III.—Very few candidates showed an adequate knowledge of the treatment of sales on the hire-system, and there was often a failure to realise the difference between the book value of assets and their realised value. The matter of adjustments to be made before the preparation of the accounts also caused difficulty to many candidates.

SHORTHAND.

Stage I.—The teaching in this Stage at most centres has been good. Very many sets of shorthand notes were well written and ought to have been easily deciphered, but a considerable number of the candidates evidently had not devoted as much time as they should have done to "reading back" their own notes or to reading printed or lithographed shorthand matter. Consequently there was, as usual, a very heavy crop of misrenderings. For instance, "*glass case*" was a very common error for "*close guess*." Other misrenderings were "*class case*," "*class because*," "*class goods*," "*close glance*," etc., and "*boy product*" was very frequently transcribed "*by-product*," and "*bye-product*." Other mistakes which appeared in the transcripts were "*bit proud*," "*boy pedigree*," "*boy preacher*," "*pet product*," and "*boiled product*."

The 60 words a minute test produced some very quaint misrenderings. At the end of the third minute, for "At the taverns they put him in short beds," one candidate wrote, "*On the liners they put him in their beds*." "Taverns" was often mis-spelt "*tavins*," and in one case was transcribed "*devils*." Instead of the individual referred to being put in "short beds," according to two or three papers he was put in "*short pants*." But it was in the following sentence that the greatest number of clashes were made: "He was lying on his couch diagonally, with his head upward against the head-board, his feet braced against the opposite piece, and his knees a little bent." "Diagonally" was often spelt wrongly. For "upward" we find "*backward*;" for "head-board," "*head bar*," "*solid part*," "*slab part*," "*hat board*," and "*sloped board*." More than half the transcripts had "*pressed*" for "braced." "*Raised*" and "*placed*" were common mis-hearings for the same word. For "opposite piece" we find "*fusty piece*," "*possessed post*," "*balust post*," "*bedside post*," "*bedside base*" and "*bedside beast*." Near the end of the passage, "It was hard," he said," was dictated. One variation of this phrase was, "It was *hell*," he said."

Stage II.—The 80 words a minute tests were, in the main, good. In one transcript "*£2 a ton*" appeared instead of "two-pence a pound." In another paper, instead of tea being "a most popular beverage," it was said to be "*a mere public privilege*."

In the 100 words a minute test many candidates seem to have experienced some difficulty with the phrases "fine table bird" and "tiny pellets." Among many mis-renderings of the former we find: "fine *double* bird," "fine *edible* bird," "fine *dappled* bird," "fine *payable* herd," "fine *tailed* bird," "fine *tame* bird" (common mis-hearing), "fine *developed* bird," "fine *double* output," "fine *tripple* brood,"

"fine double breed," and "fine suitable bread;" and for "tiny pellets," "*damping bullets*"—also tiny "*pebbles*," "*currants*," "*millets*," "*pills*," and "*balls*." There were frequent clashes between "meal," "milk," "market," and "America." Variations of "chilled beef" included "*salted*," "*billed*," and "*boild* beef."

Many candidates attempted to do too much; that is to say, they transcribed, or endeavoured to transcribe, both passages, generally beginning with the test at the higher speed. In their endeavour to complete both transcripts in the allotted time many failed at both speeds. To judge from the shorthand notes there is no doubt that several could have passed the 100 words a minute test had they devoted the whole of their time to it.

Stage III.—In the May-June 120 and 140 words a minute tests the percentage of passes was very low.

Apparently some of the candidates who took down the May-June 120 words a minute passage could not follow the sense while it was being dictated. It is quite true that one does not expect to find that lack of common sense and general knowledge and disregard of the context among Stage III students which is so often disclosed in the transcripts of Stage I and Stage II students. But what can be said of candidates who make such mistakes as the following?—"martyr or rebel" for "murder or robbery;" "a ghost scene" for "a ghost seen;" "*began my vision*" for "became my passion;" "regular costume" for "local custom;" "falling door" and "*valiant doer*" for "falling tower;" "*foreign facilities*" for "various philosophers;" "*open roads*" for "obscure ruins;" "to paint sand—" "to paint further papers," "to paint soft portraits" for "to paint St. Peter's"; "the Bed of Naples" for "the Bay of Naples."

"One cannot help thinking," writes the Examiner, "that the range of subject matters selected for students' shorthand dictation and speed practice has been too limited, and that too much prominence has been given to subjects of a commercial and semi-commercial nature." And there is some foundation for coming to this conclusion. In going through the many thousands of papers it not infrequently happens that, at the backs of the pages on many sets of shorthand notes sent in, the shorthand dictation practice is to be seen; and in nearly every case among Stage I papers it consists of short business or commercial letters. Further, at the top of the transcripts of several May-June Stage I papers there was written in longhand the words "First letter." This, coupled with what was seen at the backs of many sets of shorthand notes, clearly indicates that, to a very large extent, in Stage I at any rate, dictation practice has been confined to matter of an easy commercial nature. It is not surprising, therefore, when candidates come into the examination room and are confronted with a speed test the subject-matter of which they have not been accustomed to, that the percentage of passes is not higher.

TYPEWRITING.

Stage I.—A good many candidates did badly in the time-test in over-anxiety to gain speed. It is better to type a smaller part of the text accurately with a slight deduction of marks for lack of speed than to type the whole passage with numerous errors.

Stage II.—The standard of work submitted was on the whole very satisfactory, though some scripts were marred by atrocious spelling. The Examiner finds it necessary to emphasise the importance of accuracy in copying figures. One date, 1680, was typed 1580, 1608, 1894, 1980, and 171499.

Stage III.—The standard was good, though here again the time test was marred by many inaccuracies due to nervousness or over-hasty manipulation.

HISTORY.

Stage I.—The Examiner in History makes a complaint that is echoed by many of his colleagues. Many scripts give the impression that the candidates could add materially to the marks they obtain if they would exercise a little more care in preparing their answers. They either fail to answer the question asked, or only deal with a small portion of it. If they would study the exact meaning of the question before they begin to write, and confine themselves to the definite point, there would be far fewer failures.

ECONOMIC GEOGRAPHY.

Stage I.—A great many candidates did not know the meaning of "basin," as applied to rivers, which shows gross neglect of proper regional teaching. Others could not locate Mediterranean areas although they knew their names. Good sketch-maps were common, and were often much better than the text. As the Examiner remarks: "These candidates need to learn how to *describe*; their knowledge is quite sufficient, and their mapping is really good; but they cannot formulate their knowledge, and do not recognise it even on their own maps."

Stage II.—There is a continued improvement here, not only in the quality of the map work, but also in the written part. Apparently, however, much of the teaching is non-regional, and many candidates had no idea of what is meant by a "Natural Region." In a good many cases the answers suggested that accounts of countries had been memorised, and there was a good deal of evidence that teachers had taught, not on rational lines, but only what they thought would "pay."

Stage III.—The descriptive work was generally good, and sketch maps were numerous and adequate. The faults of teaching which appeared in the Stage II papers still persist here. "Teachers *will* believe," writes the Examiner, "that the shortest, easiest and most 'paying' way to prepare for this examination is to select bits of the set area and specialise on them. . . . They would save time and labour, and get far better results, by teaching the area as an area; for then pupils would have it as a unit, and would really understand . . . the general character of the whole and the relations of the parts." It is earnestly hoped that teachers will read and pay attention to the Examiner's advice.

ECONOMIC AND SOCIAL HISTORY.

Stage II.—The general standard of the work was fairly high, and some excellent papers were submitted, the best candidates showing a real interest in the subject. A good many candidates who just fail would pass if they would learn better how to answer questions and take more care in realising exactly what is asked of them.

Stage III.—Here again many candidates failed to examine the questions thoroughly before beginning to answer them, with the result that much irrelevant information was given. One candidate, for example, began his answer to the question on the iron industry of the 18th century by describing the industry in the days of the Romans, and then worked steadily through the following centuries.

ECONOMIC THEORY.

Stage II.—The work varied from very good to very poor. Many candidates appeared to have derived their knowledge of Bank of England notes from an out-of-date pre-war text book. Several answered the question "How is the wage of an artisan determined?" by writing "according to the quantity or quality of the pictures

he has painted." A good many had very hazy ideas about cheques and did not realise that there was any difference between an "open" and "blank" cheque.

Stage III.—The general standard of the work was quite satisfactory, but in the May-June examination some of the candidates were very weak.

PRÉCIS-WRITING.

Stage II.—The great majority of the candidates were able to pick out the salient points of the passage set, but they varied greatly in their powers of reproducing them. A précis ought to be a piece of good English, and telegraphic phrases, into which examinees are tempted for the sake of brevity, should be avoided.

Stage III.—Some candidates appear to be under the impression that in a précis facts should be avoided, whereas its object is to put the reader in possession of all the important facts. The passage set was taken from the speech of a Chairman at a public meeting, and as it dealt with a number of subjects not closely related to one another, it was difficult to epitomise the speech without making it seem disconnected. The best candidates, however, succeeded in doing this with considerable skill.

COMMERCIAL LAW.

Stage II.—The papers worked at the April examinations are described by the Examiner as excellent, and showing evidence of sound teaching and a good knowledge of commercial legal principles. The problem questions were answered with intelligence and ability. Unfortunately, the papers worked at the May-June and July examinations were very much poorer, and a number of the candidates were far below the standard required. Two of them stated that an agent for the Government who received bribes was liable to prosecution for treason, and another stated that capital punishment would be the fate of the offender.

Stage III.—Although some candidates drew on their imaginations rather than their knowledge of law in describing the disadvantages of being an undischarged bankrupt, most of the papers showed an intelligent appreciation of the principles of Commercial Law. A few failed because they only answered three or four of the questions.

COMPANY LAW.

Stages II and III.—The Examiner reports that in both Stages many candidates had failed to study the changes made by the Companies Act, 1929. As this is the first examination since the coming into operation of the Act, some allowance has been made in marking the papers this year, but in 1931 and subsequently a higher standard of accuracy and greater knowledge of detail will be required.

RAILWAY LAW AND PRACTICE.

Stage III.—The general standard of the work was high and there were some exceptionally good papers. In dealing with problems it was evident that the candidates had received very sound training.

RAILWAY ECONOMICS.

Stage III.—In reporting on the work submitted in this subject the Examiner limits himself to commenting on the extraordinarily bad spelling of the candidates. "Defnetly," "saleries," "desidedly," "bancrupt"—these are some of the instances which he mentions. It is deplorable that students at this stage of the examinations should be so ignorant of their mother tongue.

ACCOUNTING.

Stage III.—On the whole the papers sent in were satisfactory. The subject of Income Tax, as usual, appeared to have been insufficiently studied, and the changes prescribed in the form and contents of Balance Sheets by the Companies Act, 1929, had not been generally grasped. Questions dealing with dissolution of partnerships and the entries relating to Goodwill were for the most part well answered.

BANKING.

Stage III.—While there was no paper of outstanding merit in this subject the average standard was quite good.

COSTING.

Stage III.—Candidates seemed to experience much difficulty in stating the principles on which to base a system of uniform costing for factories making similar products. Their ideas, as a rule, were limited to a common stores system and headquarters control.

COMMERCE.

Stage I.—The work on the whole was satisfactory. In the April papers there were a good many cases of weak spelling, such as "principle" for "principal," "wharehouse" for "warehouse," and "as" for "has." At the May-June and July examinations, however, the Examiner reports that the scripts were neatly written and the spelling good. Most of the candidates possessed a sound knowledge of the facts involved in the questions, but here, as in many other cases, they failed too often to grasp their exact significance and wasted time in giving irrelevant replies.

Stage II.—The average standard of the work was fair, but there was a lack of papers of outstanding merit. The commonest fault was want of precision in defining terms and inability to appreciate the significance of a correct definition. The misreading of questions was a second serious fault and the third was irrelevance. Very few candidates knew the meaning of the term "free ports," which was usually taken to mean "free trade," and led to long discussions on safeguarding and unemployment. Spelling was good, as a rule, but a surprising number of candidates wished to "illuminate" or "illiminate" the middleman.

Stage III.—The work on the average was fair to good, with few really brilliant answers. There was still a tendency to misread questions and to write out carefully prepared answers to questions which had not been asked. Transport rates appeared to be much of a mystery to many candidates, and very few appeared to have made any attempt to specialise in sections.

SHIPPING LAW AND PRACTICE.

Stage III.—The Examiner reports that as regards actual knowledge, the candidates showed that they had been very carefully prepared, but an extraordinary number of them misread the questions. Often a long answer was written without a single mistake, but it had little or nothing to do with the question asked.

LAW AND PRACTICE OF MARINE INSURANCE.

Stage III.—The average standard of these papers was good, and shows that on the whole the instruction was on sound lines. Unfortunately, in many cases spelling and grammar were both weak—a complaint which ought to be impossible in the case of Stage III candidates.

ADVERTISING AND SALESMANSHIP.

Stage III.—There is a distinct improvement on the standard of excellence as compared with last year, and very few bad papers were submitted. The questions of copyright and trade-marks seem to require greater attention.

FOREIGN EXCHANGE.

Stage II.—The papers submitted were fair. There was a certain amount of confusion between a Commercial Letter of Credit and a Traveller's Letter of Credit, and there were some careless errors in working the arithmetical question.

Stage III.—The results here were very satisfactory, as there was not a single failure, and 5 out of the 10 candidates received first-class certificates.

STOCK EXCHANGE LAW AND PRACTICE.

Stage II.—The Examiner comments on the weakness in English and spelling of several of the candidates. The general results, however, were fairly satisfactory, as only 9 failed out of a total of 66.

Stage III.—The papers here were very mixed in quality, and the proportion of failures—12 out of 30—was very much higher than in Stage II. The answers to question 3, "What are 'Rights'?" suggested that a standard answer to this type of question had been memorised.

MODERN LANGUAGES.

FRENCH.

Stage I.—The Examiner gives a most gratifying report on the work submitted at the April examination, when the number of "credits" actually exceeded the number of failures. This improvement in the results is not due to any lowering of the standard; there is ample evidence to show that greater attention is being paid to the study of elementary grammar. It seems strange that many candidates, while able to give verb forms correctly when asked for them, yet use an incorrect form in their translation. The only cure for this is constant practice in their use in concrete sentences.

Stage II.—Some very good work was done in this Stage. In the April examination the number of first-class certificates was higher than in any recent years. The papers submitted in July were distinctly poorer than in the other two examinations, especially in the translations into English. Many of the candidates used what the Examiner calls "lazy English"; *i.e.*, they merely took an English word which resembled the French one in form, without bothering about the sense or the style. Some of the essays, however, were excellent. Apart from those on "Autumn," which produced much sentimental rubbish, "where exclamation marks did duty for verbs, and where catalogues of trees and plants took the place of properly constructed sentences," there were some well-written accounts of motor-coach rides.

GERMAN.

Stage I.—The weak point with the majority of candidates was, as usual, in their knowledge of grammar. Again and again the Examiner has called attention to this serious defect, and it is high time that teachers should make strenuous endeavours to eradicate it. In the July examination a considerable number of scripts reached a high standard, and some of the free compositions were excellent.

Stage II.—In this stage also there was far too much grammatical weakness among the candidates. Many of the German compositions were marked by flagrant violations of the universal rules of syntax, *e.g.*, subjects in the accusative, prepositions governing impossible cases, plural verbs in agreement with singular subjects, etc. There were, however, a few good papers, especially at the July examination.

Stage III.—The general level of the answers was satisfactory, though many were still marred by bad mistakes in grammar and accidentence. It is quite impossible to get a mastery of any language unless these foundation stones are well and truly laid.

SPANISH.

Stage I.—In view of the great potential markets for British goods in the Spanish-speaking countries of America it is gratifying to note that the number of candidates studying this language continues to increase year by year. Thus the total entries in all stages for 1930 were 1,072, as compared with 908 in 1929. Spanish now comes next in numbers to French, being well ahead of German, in which the total this year was 735.

The results in Stage I were generally satisfactory. There was a certain amount of weakness in grammar, especially with the verbs, but quite a number of the essays were good, and the vocabularies on the whole were very fair.

Stage II.—The quality of the work has improved since last year, especially in the translation into Spanish; but although the vocabularies were fair, there was still too much grammatical weakness.

Stage III.—The work on the whole was fairly satisfactory, and the full compositions showed a distinct improvement as compared with those of recent years. The Commercial students acquitted themselves better than the literary candidates.

ITALIAN.

Stage I.—The work on the whole was good and in some cases excellent, although a few candidates presented themselves who were quite below examination standard.

Stage II.—The Examiner reports that the work in this Stage was "quite good," and that he was satisfied with it.

Stage III.—In view of the difficulties of the passages set for composition and translation the results were on the whole satisfactory, although here again a few candidates appeared who were far below the standard required at this stage.

RUSSIAN, PORTUGUESE, SWEDISH, DANISH AND DUTCH.

The numbers taking these languages are naturally small, and it is difficult to draw any general conclusions about the results, except to state that as a rule the candidates' knowledge of grammar is all too defective.

ORAL EXAMINATIONS

The results of the Oral Test, which is now compulsory, for all candidates in the Advanced Stage of French, German, Spanish, and Italian, were again well up to the average, the figures being rather better than those of last year. An important part of the Oral Test is the taking down of a passage dictated in the foreign language by the Examiner, and in the past this has been a source of great weakness with many candidates. It is gratifying to be able to state that the examiners now report a very great improvement in this branch of the examination.

ORAL EXAMINATIONS HELD DURING 1930.

Subject.	No. of Examina- tion Centres.	No. of Exami- ners.	No. of Candi- dates examined.	Passed with Dis- tinction.	Passed.	Failed.
French ..	42	29	437	91	259	87
German ..	12	10	63	11	45	7
Spanish ..	17	20	116	24	73	19
Italian ..	5	4	24	7	15	2
	76	63	640	133	392	115

The thanks of the Council are once more accorded to the Court of the Cloth-workers' Company, who have generously renewed their grant of £40 towards providing medals in all the subjects of examination where the work of candidates attains a sufficiently high standard. There is no doubt that there is very keen competition for these medals, and that they have done much to maintain or raise the level of excellence in the papers worked.

SCHOOL AND JUNIOR SCHOOL CERTIFICATE EXAMINATIONS

These Examinations were held for the fourth year in March and July last. As in the Evening Examinations there has been a steady growth in the number of entries.

In 1927 the figures were :

For the School Certificate Examination	..	..	..	43
„ Junior „ „ „	..	..	..	269

In 1930 the figures were :

For the School Certificate Examination	..	..	..	208
„ Junior „ „ „	..	..	..	815

Unfortunately the results this year were not so satisfactory as in 1929. There was a marked rise in the proportion of failures, which would seem to be due to the fact that at certain centres the high standard of the Examinations is not yet appreciated and candidates are entered who are not sufficiently prepared. A comparison of the figures for the last two years is given below :—

SCHOOL CERTIFICATE EXAMINATION.

			1st Class.	2nd Class.	Failures.
1930	..	..	23 (11.4%)	69 (34.1%)	110 (54%)
1929	..	..	19 (12.8%)	70 (47.3%)	59 (39%)

JUNIOR SCHOOL CERTIFICATE EXAMINATION.

1930	..	..	94 (11.5%)	256 (31.5%)	463 (57%)
1929	..	..	103 (14.1%)	286 (39.3%)	338 (46.6%)

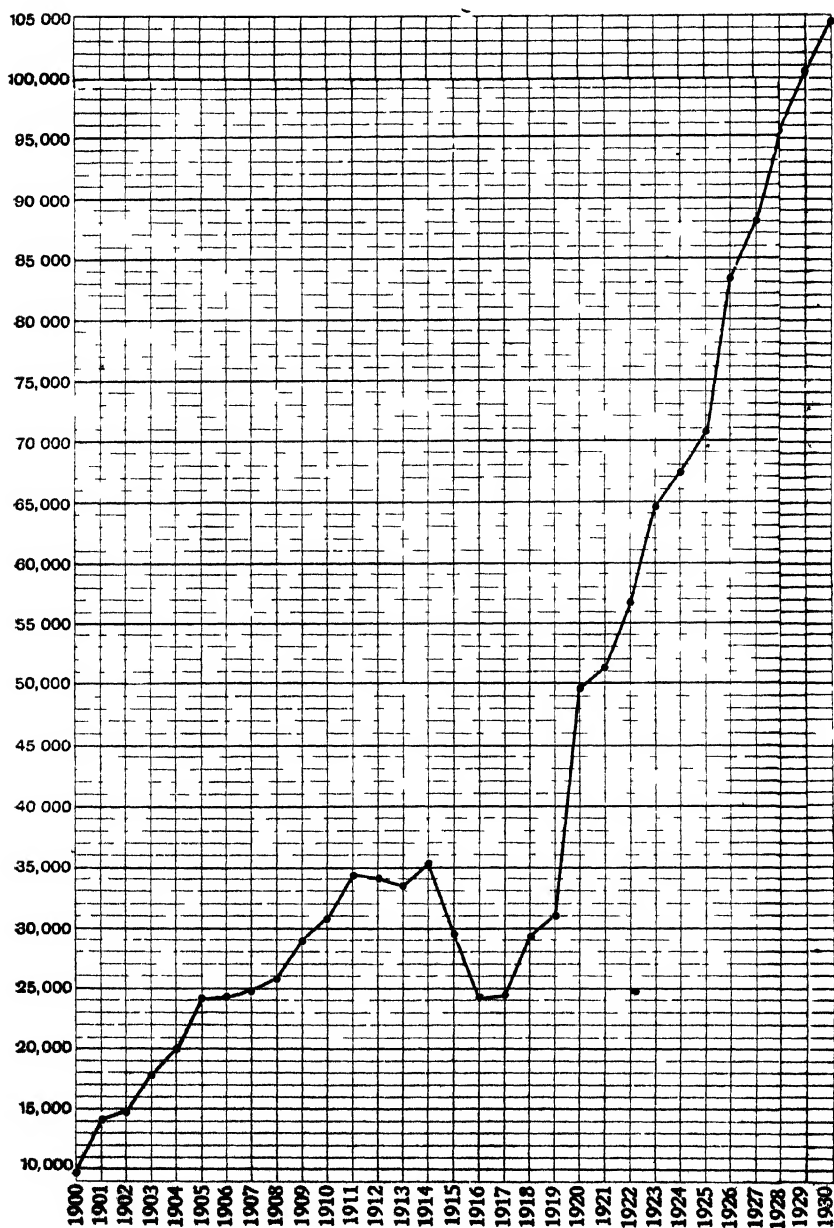
Full reports from the Examiners on the work submitted at the Examinations are published with the Syllabuses, and teachers are very strongly urged to make a careful study of these.

DETAILS OF THE 1930 EXAMINATIONS.

SUBJECTS.	STAGE III.—ADVANCED.				STAGE II.—INTERMEDIATE.				STAGE I.—ELEMENTARY.				Total number of Papers worked in all Stages.	
	Papers worked	1st-class Certificate	2nd-class Certificate	Not Passed	Papers worked	1st-class Certificate	2nd-class Certificate	Not Passed	Papers worked	Passed credit	Not Passed	Passed	1930	1929
Arithmetic ..	440	70	174	196	2,824	462	1,064	1,298	8,123	833	4,673	2,617	11,387	11,623
English ..	465	22	272	171	2,356	166	1,475	715	4,923	102	3,060	1,761	7,744	7,274
Book-keeping ..	3,799	233	1,636	1,930	9,175	2,009	5,371	1,795	12,411	1,454	7,614	3,343	25,385	24,289
Economic Geography ..	45	5	24	16	230	18	121	91	659	31	391	237	934	1,048
Shorthand ..	1,799	237	405	1,157	8,683	1,830	3,772	3,081	6,747	1,634	2,490	2,623	17,229	18,558
Typewriting ..	1,315	458	742	115	4,697	2,462	1,780	455	5,360	1,209	3,325	826	11,372	10,398
History ..	—	—	—	—	—	—	—	—	222	9	111	102	222	—
Economic and Social History ..	31	10	14	7	73	16	22	35	—	—	—	—	104	253
Economic Theory ..	214	18	133	63	416	37	240	139	—	—	—	—	630	567
Précis-writing ..	44	4	22	18	113	14	58	41	—	—	—	—	157	151
Commercial Law ..	170	27	119	24	416	116	202	98	—	—	—	—	586	519
Company Law ..	90	5	63	22	233	50	129	54	—	—	—	—	323	308
Accounting ..	491	25	247	209	—	—	—	—	—	—	—	—	401	480
Banking ..	28	1	18	9	—	—	—	—	—	—	—	—	28	15
Costing ..	105	7	54	44	—	—	—	—	—	—	—	—	105	93
Foreign Exchange ..	10	5	5	—	18	4	11	3	—	—	—	—	28	26
Commerce ..	330	11	215	104	1,238	54	751	433	1,587	83	1,075	429	3,155	2,872
Railway Law and Practice ..	44	9	22	13	—	—	—	—	—	—	—	—	44	20
Railway Economics ..	25	5	13	7	—	—	—	—	—	—	—	—	25	12
Shipping Law and Practice ..	41	6	23	10	—	—	—	—	—	—	—	—	41	30
Stock Exchange Law & Practice ..	30	4	14	12	66	28	29	9	—	—	—	—	96	35
Law and Practice of Marine Insurance ..	33	7	15	11	—	—	—	—	—	—	—	—	33	42
Advertising and Salesmanship ..	111	27	69	165	—	—	—	—	—	—	—	—	111	101
French ..	412	38	209	165	1,775	375	877	523	3,602	695	2,032	875	7,789	5,563
German ..	69	17	38	14	218	57	77	84	448	44	244	160	736	570
Italian ..	24	7	14	3	22	14	7	1	61	17	33	11	107	114
Spanish ..	122	9	80	33	325	18	257	50	625	39	505	81	1,072	908
Russian ..	5	1	3	1	6	2	4	1	9	2	5	2	20	21
Portuguese ..	7	1	4	2	2	—	—	—	—	—	—	—	9	10
Swedish ..	3	—	2	1	8	—	2	6	13	5	1	4	16	7
Danish ..	—	—	—	—	—	—	—	—	5	3	9	1	13	—
Totals, 1930 ..	10,302	1,279	4,651	4,372	32,898	7,732	16,253	8,913	44,565	6,143	25,449	12,973	88,000	—
" 1929 ..	9,544	1,335	4,419	3,790	30,920	6,041	14,264	10,915	45,443	6,827	24,574	14,042	—	85,907

In addition to the figures given above, 7,832 papers in the Elementary Stage were worked in May at the Group Course Examination for London County Council Junior Commercial and Technical Institutes, and 8,413 papers were worked at the Junior School and School Commercial Certificate Examinations held in May and July. The grand total of papers worked in 1930 is, therefore, 104,245.

DIAGRAM SHEWING NUMBERS OF PAPERS WORKED IN THE ROYAL
SOCIETY OF ARTS EXAMINATIONS, 1900-1930



GENERAL RESULTS, 1930

FULL CERTIFICATES AWARDED

SCHOOL CERTIFICATE

Candidates, 202 ; First-class certificates, 23 ; Second-class certificates, 69.

JUNIOR SCHOOL CERTIFICATES.

Candidates, 813 ; First-class certificates, 94 ; Second-class certificates, 256.

TABLE SHOWING THE NUMBER OF PAPERS WORKED IN THE SCHOOL AND JUNIOR SCHOOL CERTIFICATE EXAMINATIONS IN MARCH AND JULY 1930, TOGETHER WITH THE RESULTS

SUBJECTS.	SCHOOL CERTIFICATE EXAMINATION.								JUNIOR SCHOOL CERTIFICATE EXAMINATION.							
	MARCH.				JULY.								JULY.			
	Number of Papers worked	Passed 1st Class	Passed 2nd Class	Failed.	Number of Papers worked.	Passed 1st Class	Passed 2nd Class	Failed	Number of Papers worked Passed with Credit	Passed.	Failed	Number of Papers worked	Passed with Credit.	Passed.	Failed	
Arithmetic ...	8	1	3	4	206	43	88	75	118	2	67	49	682	93	352	237
Book-keeping	8	—	2	6	199	27	70	102	118	6	62	50	685	61	326	298
Economic																
Geography...	8	1	2	5	201	10	106	85	118	1	56	61	683	21	333	329
English ...	9	—	5	4	214	15	103	96	116	4	83	29	674	19	422	233
History ...	9	1	4	4	198	11	81	106	117	6	52	59	689	9	288	392
French ...	6	1	2	3	131	15	57	59	91	4	57	30	514	22	327	165
Commerce ...	2	—	2	—	166	19	109	38	36	—	34	2	454	25	319	110
Mathematics...	4	—	1	3	23	1	10	12	79	14	42	23	315	38	136	141
Shorthand* ...	7	1	1	5	210	19	82	109	78	30	21	27	531	117	184	230
Typewriting ...	40	11	16	13	337	195	131	11	—	—	—	—	—	—	—	—
Natural Science	—	—	—	—	6	1	2	3	41	2	24	15	271	8	96	167
German ...	—	—	—	—	1	—	—	1	—	—	—	—	—	—	—	—
Spanish ...	—	—	—	—	10	3	3	4	—	—	—	—	—	—	—	—
Totals ...	101	16	38	47	1,902	359	842	701	912	69	498	345	5,498	413	2,783	2,302

*In Shorthand, First and Second-class in the School Certificate Examination represent speeds of 100 and 80 words per minute, respectively. In the Junior School Certificate Examination the figures in the Passed with Credit column represent a speed of 60 words per minute, and those in the Passed column a speed of 50 words per minute.

CORRESPONDENCE

MODERN ARCHITECTURAL SCULPTURE

With a certain illogical logic, Mr. Gill seems to put sculpture in its proper place. Repetition is the essence of bullying: aptly enough, it is the essence of the machine: it is the death of Art: there is no room for sculpture on the machine-made building—no niche for it in mechanistic architecture. For this is what Mr. Gill implies by modern architecture—Architecture severe, austere with the cosmic beauty of simple Euclidean geometry—its spaces conscious of the bounding planes; its outlines the outcome of

its intersections; a piece of metallic or composition pastry—but *ex dea machineæ*. Its cubes are dictated by its functions, its growth and expression are dictated by the capacities of machine-made material. It "reflects our mechanical triumphs" and, in spite of lyrics in Praise of Stockholm 1930, it is not architecture. Here is no place for sculpture, for sculpture is human, and the Great Goddess Machine is ruthless, with the inhumanity of an Easter Island image. But architecture will continue, and mechanistic nonsense will follow art nonsense into oblivion. Mechanical building is not the architecture of the future, for it is not architecture and has no future. The machine must be dominated, not submitted to, and the architect's material and technique be capable of control. The evolution of this condition will produce modern architecture, really modern, really architecture. It will reflect, not our mechanical triumphs, but the progress resulting from these triumphs, and there will still be ample field for sculpture which will complete the architectural expression.

Mr. Gill, robbing the sculptor of his juicy architectural pasture, endeavours to console him with meads of mantelpieces and museums. Sculpture would certainly starve in these fields; were I a sculptor I could raise but little enthusiasm for mantelpieces and, in any case, none for museums. Fortunately, there is one setting for sculpture which will always be with us—its natural setting—Nature. Sculpture if frozen off buildings, might expand more genially away from self-conscious creation.

Mr. Gill is aware, and rightly so, that much sculpture stands, sits, reclines or otherwise postures uncomfortably on many modern buildings—the new Underground building for instance. May it be suggested, delicately, that the discomfort may be due not only to the building, but also to the sculpture itself. Is it not possible for sculptors to explore more thoroughly complete abstractions of form than have hitherto been unveiled? Forms having less relation to the human figure, with more distinctly geometrical bases, if not affinities—sculpture which "shall be beautiful as bones and crystals, and beetles and iron girders and precipitous cliffs of rocks are beautiful."

J. W. M. HARVEY.

MEETINGS OF OTHER SOCIETIES DURING THE ENSUING WEEK

MONDAY, OCTOBER 27. Actuaries Institute of, Staple Inn Hall, Holborn, W.C. 5 p.m. Presidential Address by Mr. W. U. Troncker.
British Academy, Burlington Gardens, W. 5 p.m. Dr. E. L. Sukanik, "Ancient Synagogues in Palestine and Greece (Schweich Lecture I.)"
Electrical Engineers, Institution of, Savoy Place, W.C. 7 p.m. Discussion on "The Link between Sales, Manufacture and Research," opened by the President (Mr. C. C. Paterson).
Junior Institution of Engineers, at 16 St. Mary's Parsonage, Manchester. 7.30 p.m. Mr. W. H. D. Sutherland, "Some Notes on Drying Machines."
University of London, at King's College, Strand, W.C. 5.30 p.m. Prof. L. W. Seton-Watson, "The History of Serbia. Lecture III—Serbia under the Turkish Yoke."
At the London School of Economics, Aldwych, W.C. 4.30 p.m. Prof. P. Vaucher, "Political Parties in France, 1814-1880." (Lecture III.)
5.30 p.m. Prof. Don Salvador de Madariaga, "The Development and Present Position of the Sanctions of the League of Nations."

At the School of Oriental Studies, Finsbury Circus, E.C. 4.30 p.m. Prof. H. H. Dodwell, "The Historical Geography of India." (Lecture III.)
At University College, Gower Street, W.C. 5 p.m. Dr. H. P. Gilding, "The Reticulo-Endothelial System." (Lecture III.)
5.30 p.m. Prof. F. von der Leyen, "Popular German Poetry." (Lecture I.)
5.30 p.m. Prof. A. Penck, "The Relations of Europe and Central Asia." (Lecture II.)

TUESDAY, OCTOBER 28. Automobile Engineers, Institution of, at the King's Head Hotel, Coventry. 7.30 p.m. Sir Herbert Austin, Presidential Address, "The Future Trend of Automobile Design."
Electrical Engineers, Institution of, at the Hotel Metropole, Leeds. 7 p.m. Address by Mr. H. G. Fraser (Chairman of the North Midland Centre).
At the Engineers' Club, Manchester. 7 p.m. Address by Mr. A. L. Lunn (Chairman of the North-Western Centre).
At 39, Elmbank Crescent, Glasgow. 7.30 p.m. Address by Mr. E. Seddon (Chairman of the Scottish Centre).
At the Technical College, Derby. Mr. H. H. Dyer, "Some Applications of Electricity to Railway Signalling."

- Metals, Institute of, at the Y.M.C.A., Swansea. 6.15 p.m. Dr. W. Rosenhain, "Impurities in Copper."
- Photographic Society, 35 Russell Square, W.C. 7 p.m. Prof. Sir William Bragg, "X-Rays and the New Range of Vision."
- University of London, at King's College, Strand, W.C. 5 p.m. Dr. J. W. Pickering, "Blood Plasma and Platelets." (Lecture IV.)
5.30 p.m. Prof. F. Bednar, "The Relations between the Lollards and the Hussites."
5.30 p.m. Prof. Sir B. Pares, "Contemporary Russia. Lecture IV—Reaction and Repression."
5.30 p.m. Mr. T. G. Rose, "Management. Lecture II—Its Practice."
At University College, Gower Street, W.C. 5.30 p.m. Prof. T. E. Gregory, "Newmarch and his Contemporaries." (Lecture II.)
5.30 p.m. Prof. F. von der Leyen, "Popular German Poetry." (Lecture II.)
- WEDNESDAY, OCTOBER 29. British Academy, Burlington Gardens, W. 5 p.m. Dr. E. L. Sukanik, "Ancient Synagogues in Palestine and Greece." (Schweich Lecture II.)
North-East Coast Institution of Engineers and Ship-builders at Holbec Hall, Newcastle-upon-Tyne. 7.15 p.m. Address by Mr. M. Waters (Chairman of the Graduate Section).
At the Cleveland Scientific and Technical Institution, Middlesbrough. 7.30 p.m. Address by Mr. T. D. Richards (Chairman of the Tees-side Graduate Section).
Literature, Royal Society of, 2 Bloomsbury Square, W.C. 5 p.m. The Lady Margaret Sackville, "Some Aspects of Modern Scottish Literature."
Public Health, Royal Institute of, 37 Russell Square, W.C. 4 p.m. Lt.-Col. J. A. A. Pickard, "The Prevention of Street Accidents."
United Service Institution, Whitehall, S.W. 3 p.m. Admiral Sir Richard Webb, "The Change in the Naval Situation."
University of London, at King's College, Strand, W.C. 5.30 p.m. Mr. D. S. Mirsky, "Russian Literature in its Relation to Russian Social History (1740-1860). Lecture III—Karamzin to Pushkin."
At King's College, Strand, W.C. 5.30 p.m. Mr. H. Walpole, "Professions and Careers. Lecture IV—Literature."
At the London School of Economics, Aldwych, W.C. 6 p.m. Lecture on "Office Machinery" (IV).
At University College, Gower Street, W.C. 5.30 p.m. Dr. E. A. Baker, "Public Libraries and the School-Leaving Age."
5.30 p.m. Mr. J. H. Helweg, "Danish Castles and Manor Houses." (Lecture III.)
- THURSDAY, OCTOBER 30. Antiquaries, Society of, Burlington House, W. 8.30 p.m.
Automobile Engineers, Institution of, at the Engineers' Club, Manchester. 7 p.m. Sir Herbert Austin, Presidential Address, "The Future Trend of Automobile Design."
Chadwick Lecture, at the British Medical Association, Tavistock Square, W.C. 5.15 p.m. Dr. Gerald Slot, "Rheumatism in Childhood."
- Chemical Society, Burlington House, W. 8 p.m.
(1) N. I. Fisher and F. M. Hamer, "A general Method for the Preparation of Thiocyanine Dyes Some Simple Thiocarbocyanines." (2) W. H. Mills and I. G. Nixon, "Stereochemical Influences on Aromatic Substitution. Substitution Derivatives of 5-hydroxyhydrindene." (3) C. S. Gibson and J. D. A. Johnson, "Syntheses with BB'dichlorodiethylether. Part II—Heterocyclic Compounds containing two Different Atoms of the Oxygen Group in the Ring, 1:4-Selenoxan."
- Electrical Engineers, Institution of, at Trinity College, Dublin. 7.45 p.m. Address by Mr. F. H. Whysall (Chairman of the Irish Centre).
- North-East Coast Institution of Engineers and Ship-builders, at the Cleveland Scientific and Technical Institution, Middlesbrough. 7.30 p.m. Addresses by Mr. J. McGovern (President of the Institution) and Mr. J. R. Dippie (Chairman of the Tees-side Branch.)
- University of London, at King's College, Strand, W.C. 5 p.m. Dr. J. A. Hewitt, "The Metabolism of Carbohydrates and Fats." (Lecture III.)
5.15 p.m. Mr. F. Keilling, "Social and Political Ideas of Some Representative Thinkers of the Age of Reaction and Reconstruction. Lecture IV—Coleridge and the English Conservatives."
5.30 p.m. Prof. E. Prestage, "Pombal and the Society of Jesus."
5.30 p.m. Mr. H. W. Steed, "The Suicide of Austria-Hungary, 1908-1914. Lecture IV—Fate or Folly?"
At University College, Gower Street, W.C. 5 p.m. Prof. E. A. Gardner, "Greek Myths and their Representation in Art." (Lecture III.)
5.30 p.m. Miss E. J. Davis, "Re-plannings of London, 1520-1920." (Lecture I.)
5.30 p.m. Prof. F. von der Leyen, "Popular German Poetry." (Lecture III.)
- FRIDAY, OCTOBER 31. Chemical Engineers, Institution of, at the Institution of Civil Engineers, Great George Street, S.W. 6.30 p.m. Professor Dr. W. A. Bone, "High-Pressure Reactions."
Electrical Engineers, Institution of, at the Corporation Electricity Showrooms, Swansea. 6 p.m. Address by Sir A. Whitten Brown (Chairman of the West Wales Sub-Centre).
Junior Institution of Engineers, 39 Victoria Street, S.W. 7.30 p.m. Informal Meeting. Mr. E. T. Westbury, "The Two-Stroke Engine."
At 198 West Street, Sheffield. 7.15 p.m. Annual General Meeting and Address by Mr. D. G. Jones (President of the Sheffield Section).
University of London, at King's College, Strand, W.C. 5.30 p.m. Prof. D. Saurat, "Quelques aspects modernes de la poésie de Victor Hugo" (in French).
At the London School of Economics, Aldwych, W.C. 2.30 p.m. Dr. W. Rose, "German Life and Literature from 1770 (with special reference to the Life and Works of Goethe)." (Lecture III.)
- SATURDAY, NOVEMBER 1. L.C.C. Horniman Museum, Forest Hill, S.E. 3.30 p.m. Mr. D. Martin Roberts, "London in the Stuart Age."

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No. 4067

FRIDAY, OCTOBER 31st, 1930

VOL. LXXVIII

All Communications for the Society should be addressed to the Secretary, John Street, Adelphi, W.C.2.

NOTES OF THE WEEK

*"In the hearts of some men there still is sanctuary
Where the lark nests safely."*

D. H. Lawrence, *"The Triumph of the Machine."*

"It will be a happy day for England when she realises again that the true wealth of a land is in these things (the beauty of England) and in the men and women who care for these things, since the beauty and bounty of the earth must be the shadow of Paradise."

John Masefield, Poet Laureate.

"Modern Improvements."—What are described as "modern improvements" seem to be taking increasing toll of buildings which we profess to admire. Church Road, Stoke Newington, which, apart from its intrinsic charm, has associations with Defoe, John Howard, and Benjamin Disraeli, is to have one side demolished for road widening. Surely this once delightful district can ill afford to have this very characteristic piece of 18th century street architecture destroyed for so comparatively small a gain. We trust the local authorities will hesitate before taking action. It would be as deplorable as if, say, one side of Church Row, Hampstead, were to be destroyed. It is too late to plead for the Old Rectory, Dorking, because it has now been demolished, but it was an attractive little house, and one wonders if it was really necessary. Demarara House, Quay Street, Bristol, looks very dilapidated, but even in a town so full of houses of architectural interest, it is worth saving, with its old vessel figurehead. It would be quite possible to restore this and make a delightful old bookshop with offices over it. Mr. Arthur L. Salmon, who has written an interesting book on the City and suburbs of Bristol, might well take a hand in the preservation of this characteristic corner of Bristol.

Burford.—A Fellow of the Society who has been motoring through the Cotswolds sends an interesting note of his impressions of the country passed through. Starting at Whitchurch, he describes the exquisite little villages touched between Newbury and Highworth in the Lambourn Vale, which lie off the beaten track leading to Swindon. He speaks of the beauty of these villages and the sweep of the Downs as beyond description, and points out how, from Highworth on, the manner of building changes quite definitely from the soft brick, tile and thatch, to the characteristic stone building of the Cotswolds. During the latter part of the journey the traveller is constantly jarred by the carelessness in the use of the right materials in building and by glaring motor spirit stations and advertisements, the absence of which during the earlier part of the journey had so added to its enjoyment. As our correspondent neared Burford, he recalled the note in the *Journal* of 12th September, and was curious to see the sixteen cottages referred to. (It will be remembered that an attempt was made, without success, to persuade the Witney Council to build these cottages in the local manner on the same model as the cottages erected by Sir Stafford Cripps at Filkins.) He tells us that the new cottages are most disappointing, and says that it is indeed pitiable that the Witney Council could be so short-sighted as to throw away the opportunity which had been offered to them, when, with a little judicious thought and at no extra cost, admirable results might have been obtained.

Chair Bodgers and Wycombe.—*The Times* has a very interesting article on this subject from which we quote :—

“ Ever since the primitive stool developed into the seat provided with a back-rest the beech woods of the Chilterns have supplied that durable yet easily-worked wood which is converted into the traditional Windsor chair.

“ To-day a vast quantity of these chairs are manufactured in the shops of High Wycombe, where the latest machinery and power lathes produce all classes of furniture by methods of mass-production. It is surprising, therefore, to find that logs and stretchers for these modern Windsor chairs are still being turned by hand on the actual spot where the tree is felled and thence dispatched to Wycombe to be assembled in the shop. This ability of the handicraftsman to compete with the machine depends on two conditions. First, the cost of transporting the entire felled tree from wood to factory must be higher than the carriage of the turned legs over the same distance. Secondly, the craftsman working by hand must, by reason of his inherited skill and by following an economic routine of work, still be able to produce daily enough chair-legs to earn a wage about equal to that of the factory operative. At the moment, owing to depression in the factory, the advantage of the machine is even less marked than before.

“ These craftsmen love their calling. As one said : ‘ Why work in the factory ? It seems most natural to come into the wood. For 42 years I’ve been at it, and shall go on till I’m past it.’ That was no single instance, for his fellows seemed to think the same.”

Drama.—"MR. ENO." By C. K. MUNROE, ARTS THEATRE CLUB.—Our congratulations and grateful thanks are due to the Arts Theatre Club for having made up their minds to provide us consistently with entertainments which cannot easily be seen elsewhere. If they will continue staunchly to follow this policy we shall be more than willing to forgive them for their attempts in the past at compromise between the entertainment which is worth presenting for its own sake and the entertainment which may possibly prove a moneymaker if transferred to a West-end theatre.

The Arts Theatre Club is fortunate in possessing a charmingly designed and extremely comfortable little Theatre, with a small but adequate stage and good dressing-room accommodation, and still more important, it is in touch with a large potential audience which is anxious to give its sympathetic support to any sincere experimental venture or interesting revival which the Arts Theatre Club may provide for it, as long as its faith is not shattered by its being continually devoted to entertainments which are neither experimental nor interesting, but merely commonplace.

The success of George Moore's play *The Passing of the Essenes*, for which there was so great a demand for seats that it has been necessary to revive it for seven additional performances, is a proof of the willingness of the Arts Theatre Club audience to welcome a play which consists neither of sex-stuff nor sob-stuff, but which relies entirely on the beauty of its narrative and dialogue and the sincerity of its idea.

C. K. Munroe's play, *Mr. Eno, his birth, death and life*, has little in common with Mr. Moore's play, but it is no less worthy of production. It is labelled an Ironic Comedy, and admitted by the author to be an experiment. Each of the characters represents a type, and is limited to behaving characteristically to this type and talking in its clichés. They are not the types which we are accustomed to meet across the footlights, but the types which we meet in life, and for this reason, to many of the audience they were so strange in their new sphere that they found it difficult to accept them without misgiving. In the commercial theatre, where truth always prevails and virtue is always triumphant, a good character *must* stay good. A bad character may stay bad and be punished, or become good and be forgiven, but if a character which we have taken to our hearts in the first act turns out to have the failings of a villain in the second, we feel deceived and annoyed, not by the character who has ceased to count, but by the author who, we feel, has let us down.

Mr. Munroe, however, is not concerned with the commercial theatre. He is experimenting, and he makes so bold as to allow young Lionel Eno, who has gained all our sympathy in an early scene because he is cruelly jilted by his first love, show a quite villainous weakness of character and boorishness of manner in the later scenes. And he is brave enough to suggest that both a birth and a funeral may be not solely occasions of pious ritual, but also social events with a humorous side. Now this kind of departure from the conventions of the com-

mercial theatre may make a conservative audience squirm with discomfort, but it lets a breath of fresh air into an exhausted atmosphere and opens vistas of new possibilities in the theatre ; and, strangely enough, they are not vistas of fantasy but of true realism, for Mr. Munro's cliché-uttering types and expressionistic treatment of situations bear a much closer relation to life itself than all the dreary meticulous detail of the so-called "realistic school" of drama.

Mr. John Ferrald shows himself to be a fine producer, not only because he has caught Mr. Munroe's own emphasis and humour, but because every part is well played, which means a miracle of casting and direction. Mr. Roy Graham, Mr. Esmond Knight, Miss Pamela Willins and Mr. Richard Goolden may be specially singled out for the excellence of their performances, but it would be possible to bestow equal praise on any other four members of the cast chosen at random.

Art Galleries.—"CIRCUS FOLK." By Laura Knight. Alpine Club Gallery.—The first impression on entering Laura Knight's Exhibition of paintings of *Circus Folk* at the Alpine Club Gallery is one of jollity ; tu-tu skirts, piebald ponies, and the sun shining through striped canvas—all the jollity and none of the squalor of the circus. Dame Laura has discovered exactly how to paint light shining through striped canvas. She realises what a jolly effect it is, and uses it in several of her pictures, and it is always pleasing. But a closer examination of many of her oil paintings reveals a vulgarity of painting, a vulgarity, not of the circus, but of paint—unpleasant and heavy colour and a certain woodenness of drawing, all of which seem to suggest not only the possibility that Dame Laura is painting too much and too carelessly, and achieving a slickness that is becoming farther and farther removed from true vision, but also a fundamental lack of taste. By her choice of subjects she forces a comparison with Degas, and the comparison is always unfavourable. The constant emphasis of the heavy thick grey of the horses is nearly always jarring in its setting, and there is often a pinkness and a stickiness in the painting of flesh that is decidedly unpleasant.

For some reason this is not nearly so evident in the water-colours ; here the colours, though bold, are much more harmonious, and the drawing is more sympathetic. On the whole these are the most satisfactory pictures in the Exhibition, *Dressing Room* (37), *A Looking Glass* (41), and the large water-colour and pencil portrait *Barbara* (25), being especially charming.

Dame Laura is so courageous in her choice of difficult subjects, and often so clever in her handling of them—*Footprints* (23), for example, is a *tour de force* which is in many ways remarkably successful—that it is a pity she so frequently spoils her first bold conception by a petty vulgarity of treatment.

JAMES KERR-LAWSON, Paintings.

FRANCIS W. SARGANT, Sculpture.

Beaux Arts Gallery, Bruton Place.

Mr. James Kerr-Lawson's exhibition of water-colours and oil paintings of Spain and Morocco, which is being held at the Beaux Arts Gallery, rather

confirms our impressions of those picturesque countries than enlarges them. Mr. Kerr-Lawson has not much that is new to show us, but what he does show us is very pleasant.

For his water-colours and some of his oils he uses a clear poster-like style in which he sacrifices atmosphere to pattern, but the pattern, for example in *Devonshire Fisherman* (27) is often charmingly rythmical, lending a sense of movement which counteracts the flatness of the treatment.

In *Citta di Castello* (8), *The Courtyard* (10), and one or two other oils, he abandons this flat manner entirely, though he still retains a definitely marked pattern and achieves an atmosphere that is a little reminiscent of some of Sickert's Street scenes, and it is these pictures which, though they are quieter in tone, are likely to be the most lastingly successful. We recollect a very effective poster by Mr. Kerr-Lawson for the Empire Marketing Board.

There is also on view at the same Gallery a small collection of sculpture by Francis W. Sargent. *The Italian Boy's Head* (34) is the piece which makes the greatest appeal for the realistic softness of the modelling and the charm of the subject, but all his work shows careful observation.

The Dean of Winchester.—The Dean of Winchester, Dr. W. H. Hutton, had been in precarious health for a long while, but his death is a real loss to the causes for which the Society stands so definitely, and especially to Preservation work. A correspondent saw him just before he went abroad and found him full of enthusiasm and interest, especially in all that concerned the records of 18th century learning. He championed at length in the *Daily Telegraph* the proposal to preserve the House of Shenstone, which the Society has pleaded for so long and earnestly. To those who may not have time to make the acquaintance of his more learned works, we recommend his delightful volume of "Burford Papers" and his "By Thames and Cotswold." His loss will be felt on the Council of the Society for the Protection of Ancient Buildings, with whose work he was so long associated.

NOTICES

NEXT WEEK

WEDNESDAY, NOVEMBER 5th, at 8.30 p.m. (Opening Meeting.) The Inaugural Address will be delivered by SIR EDWARD GAIT, K.C.S.I., C.I.E., Chairman of the Council, on "Britain's Record in India."

After the delivery of the address the Society's silver medals awarded for papers read last session will be presented.

Tea and coffee will be served in the Library at the end of the proceedings.

FRIDAY, NOVEMBER 7th, at 4.30 p.m. (Indian Section.) SIR VIJAYA RAGHAVA ACHARYA, K.B.E., Member of the Indian Legislature Assembly and Vice-President,

Imperial Council of Agricultural Research, "The Work of the Imperial Council of Agricultural Research." SIR ATUL C. CHATTERJEE, K.C.I.E., High Commissioner for India, will preside.

Tea will be served in the Library from 4 o'clock.

BURGLARY AT THE SOCIETY'S HOUSE

On the night of Saturday, October 11th, burglars effected an entry into the Society's House through an area window, the catch of which they pushed back by inserting a knife between the sashes. They stole an engagement ring and purse, containing about £2, belonging to Mrs. James, the housekeeper's wife, two gilt replicas of the Society's Albert gold medal which were hanging in a case in the Secretary's room, a Turkish watch, which the housekeeper, Sergeant James, had bought in Mesopotamia during the War, and a Grenadier Guards' tie, also belonging to Sergeant James. The two last-named articles led, in fact, to the apprehension of the two culprits, who, two days later, were observed by a detective in a coffee house in Wellington Street, which is only two or three hundred yards from the Society's House. The men, one of whom was wearing the Guards' tie, were occupied in examining the watch, which was decorated with a design of a crescent and stars. The burglars, whose names were David Williams, aged 27, and Guiseppi Romani, an Italian youth, aged 17, were arrested and subsequently tried at the London Quarter Sessions on October 21st, where they received sentences of 9 months' hard labour, and 3 years detention in a Borstal institution, respectively. All the property, including the ring, which the burglars at first asserted they had thrown into the Thames, with the exception of the £2 in cash, has been recovered.

Hitherto it has not been thought that the Society's House, the contents of which are mainly books and papers of little commercial value, would offer much attraction to burglars, but measures have now been taken to reduce as far as possible the risk of a repetition of the occurrence.

THE DISPLAY OF SCIENTIFIC AND TECHNICAL OBJECTS*

BY COLONEL SIR HENRY LYONS, D.Sc., F.R.S.

Director, Science Museum, South Kensington

The effective display of exhibits consisting of scientific apparatus, or technical objects presents many difficulties. While those which fall within the field of art are usually attractive in themselves to a greater or less degree, this will hardly ever be the case with those classes which I am now considering. They

* Paper read at the Annual Conference of Special Libraries and Information Bureaux held at Oxford.

are probably of extreme interest, but whether they arouse in the minds of those who see them all the interest that they might, will depend on these visitors having sufficient technical knowledge to appreciate their importance, or the extent to which they constitute a material advance on others of similar character. If this knowledge is lacking wholly or in part, then the exhibitor must do what he can to make it good ; and so it comes about that the display of these classes of exhibits means not only that they must be shown to the best advantage, but also that so much information about each of them must be given as will enable those who are likely to visit them to understand enough about them to be interested and to appreciate their importance.

This provision of information for those who are familiar with the type of object shown, who know the essential characteristics of them, and who appreciate the essential points in which improvements are being made, is not usually a difficult matter.

Highly technical descriptions can be employed ; little need be said about the earlier types from which those shown have been developed ; essential points alone need be emphasised. This state of things is found at the meetings of scientific and technical Societies and Institutions where the appeal is to an expert and highly specialised audience.

But in proportion as the specialised knowledge of the visitor diminishes, so do the difficulties of the exhibitor increase.

At the other end of the scale may be placed those public museums which show objects of these kinds, and especially those in which no charge is made for admission ; for here will be found not only those who possess full technical knowledge but others also who are far less effectively equipped for studying, or even for being interested in an exhibition of this kind.

Taking the Science Museum at South Kensington as an example, the visitors include members of the general public, many of whom can have only the most elementary knowledge of the principles underlying much that is shown there or even of the manner in which they operate, or the purposes which they serve with greater efficiency or economy than did the earlier types.

Here, too, come large numbers, perhaps as many as 150,000 annually, of quite young people who are interested in the few models or other objects which are familiar to them or which they can understand, or those which may appeal for other reasons. Even now, under very unfavourable conditions, they do gain a great deal of information, but as soon as the juvenile gallery now in preparation is ready, objects will be presented to them there in such a way as to be intelligible to them as well as being attractive to them.

Then there are the students and those occupied in professional work ; for them full technical information, good lighting, suitable grouping near to earlier types are of special importance.

With care and forethought, however, it is quite possible to convey a large amount of information to those who visit a Museum, even though their technical knowledge

may not be extensive, if objects are attractively shown, if too much information is not pressed upon them, and if their comfort during the very tiring task of visiting the Museum is considered.

The first point to which attention must be paid has already been mentioned : the objects are probably not attractive in themselves ; information must be readily accessible, both for the general visitor and for those who have expert knowledge.

The key-note of the whole is development, so that the newest types should, if possible, be shown in series with some, at least, of the earlier ones, so that the kind, the amount, and the general trend of improvement can be appreciated.

Thus it comes about that in Museums, collections and exhibits which illustrate this kind of knowledge, the old and the new, the past and the present should, whenever possible, be represented, since the one supplements the other and their association goes far to tell the whole story. In the Science Museum the inclusion of examples from the earliest civilisations and from those of primitive races has helped largely to a full appreciation of the road that development has followed.

And this is not so difficult to arrange as it may seem to be ; the technical object is not usually the creative conception of an artist as is the work of a sculptor or a painter. It is usually the work of an artisan more or less skilled who is aiming at producing something more efficient than has hitherto been available ; consequently accurate copies of earlier types are quite satisfactory in cases where an original example is unobtainable. In this way copies of Galileo's telescopes, Sir Isaac Newton's reflecting telescope, water-clocks of Ancient Egypt, and many similar cases are utilised in the Science Museum to complete the story of development when no originals can be shown.

This bringing together of different stages of development makes it especially necessary to display the more important objects so that they will be recognised at once by the visitor as being those to which he should direct his attention.

This may be done by placing them in a prominent position as compared with neighbouring objects. Showing a model or a machine in motion, or so arranging it that it can be operated by the visitor, attracts attention to it, even more effectively, and has at the same time the advantage of demonstrating the method of working, and showing parts which would not otherwise be brought into view. No means of attracting attention is more effective than this, but it is, of course, more suited to a permanent Museum than to a temporary exhibition.

A great deal can be done by suitable illumination, and over and above good lighting in exhibition galleries, special lighting inside the cases to show up particular objects is usually well worth undertaking. In the same way illuminated photographic transparencies make a much greater appeal to visitors than do ordinary photographs.

The importance of descriptive and explanatory labelling has been mentioned already, but really satisfactory results are very difficult to attain. There is so

much to be said, and yet there is little use in expecting a visitor to read carefully more than about 400 words as a maximum.

Purely general descriptive matter can be printed in heavy type to distinguish it from the more technical matter, and this is of great assistance to members of the general public who wish to know what an object is, and why it is being shown ; though they probably do not wish to go further and learn how it effects its purpose, and in what features its improvements lie.

Grouping objects of a related type together, is very useful in bringing out special steps in its development, and in such a group it is often practicable and desirable to emphasise small improvements which it is not possible to show in the main collection where the interval represented between the various objects must be longer if the collection is not to become hopelessly congested.

Full-size objects and large exhibits must often be included on account of their historical importance, but unless they can be shown in a large hall or some such suitable place, they tend to dwarf the smaller models and exhibits in their neighbourhood, and to cause them to be overlooked or their real importance not appreciated. In the same way large wall diagrams may often be less effective than a greatly reduced detailed drawing of the same subject which the visitor can look at and study at ordinary reading distance.

At every point the psychology of the visitor has to be considered if he is to get the most out of his visit to see any objects whether they are in a large Museum or a temporary exhibition.

The study of any collection of objects is very tiring ; it demands close attention, the acquisition of new knowledge : it may necessitate standing in a constrained position while examining the various objects ; the number of exhibits, their comparison and the selection of those which will repay fuller study ; all these efforts make a visit a tiring experience, and therefore the comfort of the visitor must be studied.

Adequate lighting is probably the most important item, and next comes the convenient arrangement of objects so that, for example, those in front do not interfere with a clear view of those at the back of the case.

If smaller objects are placed in the lower portion of wall-cases near the floor, they are practically wasted, for visitors will not examine them, so that it is better to have wall-cases of reduced size beginning only at 2ft. 6in. from the floor.

Seating is rarely sufficient, and in a technical museum where technical visitors often take notes, stools for their use are a great amenity.

Anything that can be done to induce visitors to rest at intervals instead of trying to go through the whole series of collections at one visit greatly increases the benefit that they will gain from it. In the Science Museum demonstrations of electrically amplified gramophones and radio transmission by giving selections of music are found to be of great assistance in attaining this aim.

EXHIBITION OF PICTURES

EXHIBITION OF THE KERNOW GROUP. West Wing, Regent's Park. Till November 8th.

There is no difficulty whatever in getting to West Wing, so whoever is interested in contemporary English painting and woodcuts should not let the imagined inaccessibility of this superb house put him off going there some time during the next week.

The six artists whose works are on view have little in common, except that they are not particularly modernist. All of them react in a very direct and sympathetic way to nature, and express themselves with a certain healthy gusto. Mr. Borlase Smart in particular has a captivating breeziness. His pictures are very what one must call alive; indeed, in coming to terms with nature he shows himself almost dangerously accommodating.

Mr. Ashley Rowe's woodcuts are charming. His "Anemone," which is finished in colour, has a Japanese delicacy. Mr. A. Grinager, who shares the first room with him, is a talented painter from America, who works—like Messrs. Smart, Rowe and Moony—in Cornwall.

Mr. Enraght Moony interests us with his use of tempera not only on wood but also on canvas and paper. He has a fanciful, slightly pre-Raphaelitish (some would say particularly Rossetti-ish) imagination and touch, and a rhythm that suggests Sygne in another medium. With him nature is rather subordinated to composition; nevertheless numerous effects of natural light and colour can be singled out in his pictures.

Mr. Armfield is still nearer pattern; he is more drastic in his selectiveness, while Mr. Harry Morley uses the human figure in his compositions in a way that is more symbolic than naturalistic.

Altogether a spirited and various exhibition, held in an ideal environment; it seems a pity it is to be of such short duration.

P. B.

MEETINGS OF THE SOCIETY

ORDINARY MEETINGS

Wednesday evenings, at 8 o'clock (unless otherwise announced).

NOVEMBER 5 (8.30).—Opening Meeting of the One-hundred-and-seventy-seventh Session. Inaugural Address by SIR EDWARD GAIT, K.C.S.I., C.I.E., Chairman of the Council of the Society, on "Britain's Record in India."

NOVEMBER 12.—PROFESSOR ALBERT E. RICHARDSON, F.S.A., F.R.I.B.A., "The Royal Society of Arts Competition of Industrial Designs." THE RIGHT HON. LORD STANMORE, C.V.O., will preside.

NOVEMBER 19 (8.30).—LAURENCE BINYON, LL.D., "Persian Painting." SIR ARNOLD WILSON, K.C.I.E., C.S.I., C.M.G., D.S.O., Chairman of the International Exhibition of Persian Art, will preside.

NOVEMBER 26.—PROFESSOR WILLIAM A. BONE, D.Sc., Ph.D., F.R.S., "The Chemical Constitution of Coal." PROFESSOR H. E. ARMSTRONG, Ph.D., LL.D., D.Sc., F.R.S., will preside.

DECEMBER 3.—SYDNEY PERKS, F.R.I.B.A., F.S.A., F.S.I., "The Building of the Mansion House." ALDERMAN SIR T. VANSITTART BOWATER, Bt., M.P., will preside.

DECEMBER 10 (8.30).—A. L. B. ASHTON (of the Department of Textiles, Victoria and Albert Museum), "Persian Textiles." * * *

INDIAN SECTION

Friday afternoons, at 4.30 o'clock.

NOVEMBER 7.—SIR VIJARA RAGHAVA ACHARYA, K.B.E., Vice-President, Imperial Council of Agricultural Research. "The Work of the Imperial Council of Agricultural Research." SIR ATUL C. CHATTERJEE, K.C.I.E., High Commissioner for India, will preside.

DECEMBER 12.—ALFRED WIGGLESWORTH, "India's Commerical Fibres." LIEUT.-COL. SIR. DAVID PRAIN, C.M.G., C.I.E., F.R.S., will preside.

DOMINIONS AND COLONIES SECTION

Tuesday afternoons, at 4.30 o'clock.

NOVEMBER 25.—G. E. WOODS HUMPHERY, Managing Director, Imperial Airways, "The Development of Air Communication in Africa."

CANTOR LECTURES

Monday evenings, at 8 o'clock.

PROFESSOR CHARLES R. DARLING, F.I.C., F.Inst.P., "Modern Domestic Scientific Appliances." Three Lectures. November 24th, December 1st and 8th.

LECTURE I.—Lighting of rooms. Modern practice in illumination by means of electricity and gas. Recent forms of lamps and burners. Distribution of light. Incandescent oil lamps. Motor-driven Appliances. Vacuum cleaners. Washing machines. Hair dryers. Ventilating fans. Sewing machines. Miscellaneous devices.

LECTURE II.—Heating of rooms. Direct heating by solid fuels: recent improvements. Grates and stoves for burning smokeless fuels. Gas fires and radiators. Hot-water radiators. Electric radiators and tube heaters. Panel heating. Pipeless heating by warmed air. Comparison of efficiencies and costs of the different methods. Hot Water Supply. Boilers using solid fuels, gas and oil. Boilers heated by electricity. Use of lagging. Control of heat supply.

LECTURE III.—Modern Cooking Appliances. Newest forms of coal-fired ranges. Stoves using anthracite and coke. Gas stoves. Electrical cooking apparatus. Modern oil stoves. Thermostatic control of ovens. Steam cookers. Miscellaneous Devices: Water-softeners. Small utensils. Refrigerators—compression and absorption types. Various kinds using electricity or gas. Use of solid carbon dioxide.

(The Lectures will be illustrated by experiments and a number of the appliances mentioned will be exhibited.)

MEETINGS OF OTHER SOCIETIES
DURING THE ENSUING WEEK

MONDAY, NOVEMBER 3. Architects, Royal Institute of British, 9 Conduit Street, W. 8.30 p.m. Presidential Address by Sir Banister Fletcher.
Automobile Engineers, Institution of, at the Institution of Engineers and Shipbuilders, Glasgow. 7.30 p.m. Sir Herbert Austin, Presidential Address, "The Future Trend of Automobile Design."
British Academy, Burlington Gardens, W. 5 p.m. Dr. E. L. Sakenik, "Ancient Synagogues in Palestine and Greece." (Schweich Lecture III.)
Electrical Engineers, Institution of, at the University, Liverpool. 7 p.m. Messrs. H. A. Humphrey, D. M. Buist and J. W. Bansall, "The Steam and Electric Power Plant of Imperial Chemical Industries Ltd., at Billingham."
Engineers, Society of, at Burlington House, W. 6 p.m. Mr. H. B. Millard, "The Measurement of Water."
Farmers' Club, at the Royal United Service Institution,

Whitehall, S.W. 4 p.m. Sir Robert Greig, "The Extended Use of Temporary Pastures in Arable Farming."
Geographical Society, Kensington Gore, S.W. 8.30 p.m. Dr. Eldon Rutter, "The Hijaz."
Photographic Society, 35 Russell Square, W.C. 7 p.m. Prof. F. J. M. Stratton, "Solar Eclipse Photography."
University of London, at King's College, Strand, W.C. 5.30 p.m. Prof. R. W. Seton-Watson, "The History of Serbia. Lecture IV—The Beginnings of Serbian Independence (1804-1830)."
At the London School of Economics, Aldwych, W.C. 4.30 p.m. Prof. P. Vaucher, "Political Parties in France, 1814-1880." (Lecture IV.)
At the School of Oriental Studies, Finsbury Circus, E.C. 4.30 p.m. Prof. H. H. Dodwell, "The Historical Geography of India." (Lecture IV.)
At University College, Gower Street, W.C. 5 p.m. Dr. H. P. Gilding, "The Reticulo-Endothelial System." (Lecture IV.)
5.30 p.m. Prof. G. Murray, "Aeschylus, the Creator of Tragedy." (Lecture I.)

TUESDAY, NOVEMBER 4. East India Association, at the Caxton Hall, Westminster, S.W. 4.30 p.m. Sir T. Vijayaraghava Acharya, "Rural India and Political Reform."

Civil Engineers, Institution of, Great George Street, S.W. 6 p.m. Sir George W. Humphreys, Presidential Address.

Metals, Institute of, at Armstrong College, Newcastle-upon-Tyne. 7.30 p.m. Mr. S. L. Archbutt, "Gases in Metals."

Royal Institution, 21 Albemarle Street, W. 5.15 p.m. Dr. C. D. Ellis, "New Aspects of Radioactivity." (Lecture I.)

University of London, at King's College, Strand, W.C. 5.30 p.m. Prof. Sir B. Pares, "Contemporary Russia. Lecture V—Industrialism, Socialism, Liberalism." 5.30 p.m. Mr. T. G. Rose, "Management. Lecture III—Its Ideals."

At University College, Gower Street, W.C. 5.30 p.m. Prof. T. E. Gregory, "Newmarch and his Contemporaries." (Lecture III.) 5.30 p.m. Miss M. A. Murray, "Egyptian Statues."

WEDNESDAY, NOVEMBER 5. Analysts, Society of Public at Burlington House, W. 8 p.m. (1) Mr. Paul Arup, "The Analysis and Composition of Vegetable Parchment used for Packing Dairy Products." (2) Dr. George M. Moir, "The Determination of the Milk Proteins." (A summary of this Research will be given by Capt. J. Golding.) (3) Dr. S. G. Clarke, "The Lead Reduction Method for the Volumetric Determination of Tin, and the Interference of Copper and Antimony." (4) Mr. W. J. Agnew, "A New Method for Determining Traces of Chromium in Steel."

Central Asian Society, at Burlington House, W. 8.45 p.m. Mr. D. Hourie-Borrows, "Changes and Developments in Persia during the Pahlavi Regime."

Electrical Engineers, Institution of (Wireless Section), Savoy Place, W.C. 6 p.m. Inaugural Address by Mr. C. E. Rickard (Chairman of the Section).

Geological Society, Burlington House, W. 5.30 p.m. Heating and Ventilating Engineers, Institution of, at Swedenborg Hall, 20 Hart Street, Bloomsbury, W.C. 7 p.m. Mr. T. G. N. Haldane, "The Operation of the Heat Pump and its possible application to Heating Problems, particularly Swimming Bath Heating."

Public Health, Royal Institute of, 37 Russell Square, W.C. 4 p.m. Prof. Dr. S. L. Cummins, "The Prevention of Tuberculosis."

University of London, at King's College, Strand, W.C. 5.30 p.m. Sir B. Jackson, "Professions and Careers. Lecture V—The Stage."

Mr. D. S. Mirsky, "Russian Literature in its Relation to Russian Social History (1740-1860). Lecture IV—The Maturity of Pushkin."

At the London School of Economics, Aldwych, W.C. 6 p.m. Dr. M. Culpin, "Modern Views of Nervous Troubles." (Lecture I.)

6 p.m. Lecture on "Office Machinery" (V).

At University College, Gower Street, W.C. 3 p.m. Dr. C. Pellizzi, "La Lirica del Paradiso." (Lecture I.)

5.30 p.m. Mr. I. C. Gröndahl, "Norway, the Land and the People." (Lecture I.)

THURSDAY, NOVEMBER 6. Antiquaries, Society of, Burlington House, W. 8.30 p.m.

Auctioneers and Estate Agents Institute, 29 Lincoln's Inn Fields, W.C. 7.30 p.m. Mr. S. M. Faraday, "Defects in the Rating Acts, 1925, 1928 and 1929."

Automobile Engineers, Institution of, at the Merchant Venturers' Technical College, Bristol. 7 p.m. (1) Messrs. J. Bradley and S. A. Wood, "Some Experiments on the Factors affecting the Motion of a Four-wheeled Vehicle when some of its Wheels are Locked." (2) Messrs. J. Bradley and H. F. Allen, "Factors affecting the Behaviour of Rubber-tired Wheels on Road Surfaces." (3) Mr. A. H. Girling, "A New Automobile Braking System."

Chadwick Public Lecture, at the British Medical Association, Tavistock Square, W.C. 5.15 p.m. Dr. M. Ray, "The Treatment of Rheumatism."

Electrical Engineers, Institution of, Savoy Place, W.C. 6 p.m. Mr. D. B. Hoseason, "The Cooling of Electrical Machines."

At the College of Technology, Manchester. 7 p.m. Mr. K. Baumann, "Some Considerations in the Future Development of the Steam Cycle." (Joint Meeting

with North-Western Centre of the Institution of Mechanical Engineers.)

Electrical Association for Women, at the E.L.M.A. Lighting Service Bureau, 15 Savoy Street, W.C. 3 p.m. Miss Beatrice Irwin, "The New Art of Illumination."

Linnæan Society, Burlington House, W. 5 p.m. Refrigeration, British Association of, at the Institution of Mechanical Engineers, Storey's Gate, S.W. Messrs. L. Chew and G. T. N. Haldane, "The Use of Reversed Cycle Heat Engines of the Refrigerator Type for Heating Purposes, particularly the Heating of Swimming Baths."

Royal Institution, 21 Albemarle Street, W. 5.15 p.m. Prof. J. B. S. Haldane, "The Physiology of Water." (Lecture I.)

University of London, at Bedford College, Regent's Park, N.W. 5.15 p.m. Dr. H. Clay, "Economic Responsibility."

At King's College, Strand, W.C. 3 p.m. Mr. C. J. Gadd, "Babylonian Religion."

5 p.m. Dr. J. A. Hewitt, "The Metabolism of Carbohydrates and Fats." (Lecture IV.)

5.15 p.m. Dr. F. M. Page, "Social and Political Ideas of some Representative Thinkers of the Age of Reaction and Reconstruction. Lecture V—Robert Owen and the Early Socialists."

5.30 p.m. Dr. G. Dyson, "From Bach to Hadyn." 5.30 p.m. Mr. A. F. Meyendorff, "Russian Democracy." (Lecture I.)

At the Royal Society of Medicine, 1 Wimpole Street, W. 5 p.m. Mr. V. E. Negus, "Some Observations on Seison's Law."

At University College, Gower Street, W.C. 5 p.m. Prof. E. A. Gardner, "Greek Myths and their Representation in Art." (Lecture IV.)

5.30 p.m. Miss E. J. Davis, "Re-plannings of London, c. 1520-1920."

5.30 p.m. Dr. C. Pellizzi, "Il teatro contemporaneo in Inghilterra e in Italia" (in Italian).

Victoria and Albert Museum, South Kensington, S.W. 5.30 p.m. Prof. F. S. Yriar, "English Medieval Building: Its Sculpture and Painting."

FRIDAY, NOVEMBER 7. Electrical Engineers, Institution of (Meter and Instrument Section), Savoy Place, W.C. 7 p.m. Inaugural Address by Mr. E. Fawcett (Chairman of the Section).

Empire Society, Northumberland Avenue, W.C. 4.30 p.m. Hon. Sir William Barton, "The Indian States." Junior Institution of Engineers, 39 Victoria Street, S.W. 7.30 p.m. Informal Meeting. Mr. H. Marryat,

Luminous Electric Tubes (Neon, Helium, etc.). Mechanical Engineers, Institution of, Storey's Gate, S.W. 6 p.m. Prof. Dr. J. W. Gregory, "The Machinery of the Earth." (Thomas Hawksley Lecture.)

At the Chamber of Commerce, Birmingham. 7.30 p.m. Mr. K. E. G. Andrews, "Air-Compressors."

North-East Coast Institution of Engineers and Shipbuilders, at the Mining Institute, Newcastle-upon-Tyne. 6 p.m. Mr. R. W. Allen, "Feed Water Systems for Steam Installations."

Oil and Colour Chemists' Association, at Milton Hall, Deansgate, Manchester. 7 p.m. Joint Meeting of Manchester Scientific Societies.

Physical Society, at the Imperial College of Science, Imperial Institute Road, S.W. 5 p.m. (1) Dr. W. N. Bond, "Turbulent Flow through Tubes." (2) Mr. J. S. Rogers, "The Photographic Effects of Gamma-rays." (3) Mr. J. S. Badami, "The Spectrum of Trebly Ionised Cerium (Ce IV)." (4) Mr. S. Chapman,

"The Absorption and Dissociative or Ionizing Effect of Monochromatic Radiation in an Atmosphere on a Rotating Earth."

University of London, at King's College, Strand, W.C. 5.30 p.m. Monsieur Cattani, "L'Egypte et les Lettres Françaises" (in French).

At the London School of Economics, Aldwych, W.C. 2.30 p.m. Dr. W. Rose, "German Life and Literature from 1770 (with special reference to the Life and Works of Goethe)." (Lecture IV.)

At University College, Gower Street, W.C. 3.30 p.m. The Rt. Hon. Lord Lloyd, "The Policing of the British Empire in Time of Peace."

SATURDAY, NOVEMBER 8. L.C.C. Horniman Museum, Forest Hill, S.E. 3.30 p.m. Mr. Montagu A. Phillips, "Animal Childhood."

Royal Institution, 21 Albemarle Street, W. 3 p.m. Mr. A. Hamilton Smith, "Some Recent Archaeological Work in Italy." (Lecture I.)

JOURNAL OF THE ROYAL SOCIETY OF ARTS

No. 4068

FRIDAY, NOVEMBER 7th, 1930

VOL. LXXXVIII

All Communications for the Society should be addressed to the Secretary, John Street, Adelphi, W.C.2.

NEWS OF THE WEEK

"We are witnessing the death agonies of England because she has deliberately sacrificed her agriculture to her trade."

M. Heriot.

"A stable agriculture is the only foundation for British commerce."

Lord Ernle.

From Canada.—A Fellow and Correspondent writes:—

"From an art and literature point of view Canada is hardly ready for the development of her soul—she is still too busy developing her body. Art doesn't come to a pioneering country very easily. It is born out of trouble, certainly, but out of the growth of years, and out of some sort of established co-operation. Here, they are still fighting to develop their land. But, where the difference lies in their development is in the intervention of mechanical art, which is really a perversion. I suppose other countries strove and pioneered, and then settled and produced their poets and musicians. But Canada cannot develop her art *naturally*, because, before she produces a native art, she must fight the mechanical menace of cheap radio and imported films. You have no idea of the radio-gramophone-film grip over here. You can't go into any little restaurant, or sandwich bar, or even a drug store, without the radio or gramophone going all the time with cheap songs, bad jazz, and moaning saxophones. At last one ceases to notice it. The ultimate horror is that all the radios, like the French radios, are run practically for advertising purposes. Yesterday, at a restaurant, during a little pause in the radio music, the announcer said:—'Why not cure that tiresome cold by inhaling Vapex while you sleep. Ladies and gentlemen, I now have pleasure in presenting our Vapex-Jazz Orchestra in "Baby! Won't you please come home" and "I'm blue—till I see yew!!" Comment needless! When you think that is duplicated in millions of homes, what effect is it going to have?"

High Wycombe Altar-Piece—*The Cabinet Maker* refers to the note in the *Journal* for October 17th on the pictures in the Guildhall in High Wycombe.

In regard to the picture which was painted by Hamilton Mortimer as an altarpiece for High Wycombe Church, and which won the Royal Society of Arts prize of one hundred guineas, with Romney as a competitor, the Vicar of High Wycombe writes that this is still in the Guildhall but apparently rather out of sight. We venture to suggest that, as a matter of interest, this might be placed in a better position so that the quality of the painting could be appraised.

Art Galleries.

MR. RAYMOND COXON. Exhibition at the London Artists' Gallery, Coolings', Bond Street. Mr. Coxon is a very fine and virile landscapist. His blue-grey stone houses and Yorkshire hills and dales are what must be called powerful, but they are also beautiful; and when he takes the softer southern counties for his model he paints them with a suitable tenderness—see the delightful view of Betchworth. Here is a modern picture with naturalness enough to charm the most incurably old-fashioned.

At present, so far as one can judge, Mr. Coxon is less successful with still-life, but the large canvas of lilies reflected in a glass is admirably painted and full of life and lightness, even if the design leaves something to be desired. One or two other flower-pieces are a little stiff.

The big group of nudes by a stream is an interesting composition, more formal and more out of Mr. Coxon's head than the rest of the pictures; it has rhythm, but seems in some way unfinished compared with the landscapes. But Mr. Coxon is young, and if he goes on developing at his present rate he will no doubt soon find out exactly what he wants to do with his more purely decorative designs.

ETHELBERT WHITE, "Pastorals." MARK GERTLER, Oil Paintings. Leicester Galleries. The present Exhibition at the Leicester Galleries is rather like a dinner consisting of a grapefruit followed by a dish of curry.

Ethelbert White's "Pastorals" have the fresh clear colour and the decorative style that is peculiar to English water-colourists. Like John and Paul Nash and George Sheringham, Ethelbert White always slightly stylises his landscapes without in any way sacrificing atmosphere or light effects. He always tidies nature up a bit for her "sittings," but when he paints her she has lost none of her characteristics. Although none of these water colours is a great work, they are all so charmingly fresh that the effect of them lingers in the mind. It is difficult to say that one is better than another, though the group of pictures of beechwoods have a special beauty of subject as well as of composition and treatment.

Mark Gertler's oil paintings in the next room are a far more difficult proposition. Mr. Gertler has made himself master of his paint-box in a way that is unusual and in many ways admirable. He limits himself almost entirely to one hot exotic colour scheme, and never makes an error or produces a discord. His pictures have the garish, glowing air of a night club, and they would be woefully out of place in the early morning. Many of his paintings, the *Pineapple*, which is perhaps the

best in the Exhibition, for example, are harmonious in colour, satisfactory in composition, and interesting in texture—Mr. Gertler often alters the textures of the things he is painting to suit his purpose—and seem to lack nothing but the poignancy which makes a picture a work of art. But this essential poignancy is always lacking in Mr. Gertler's pictures, and because of that they can only be labelled "interesting."

NOTICE

NEXT WEEK

WEDNESDAY, NOVEMBER 12th, at 8 p.m. PROFESSOR A. E. RICHARDSON, F.S.A., F.R.I.B.A., "The Royal Society of Arts Competition of Industrial Designs." THE RIGHT HON. LORD STANMORE, C.V.O., will preside.

The paper will be illustrated by lantern slides.

CORRESPONDENCE

MODERN ARCHITECTURAL SCULPTURE

Mr. Eric Gill is a terrible pessimist. He tells us that "as things are, sculpture, except as furniture, has no proper place on modern building," that its place is "in the museum or upon the mantel shelf." He clings desperately to the erroneous vision of a Middle Ages in which sculpture somehow or other was an integral part of architecture, a blossoming of flowers latent in the architectural matrix. Beauty to him is an amazing concept, "the shining out of the inherent goodness and truthfulness of things," a painful phrase which makes me think of those jolly Staffordshire plates of the early Victorian age which had inscribed across them (unless obscured by buns) the text "Prepare to meet thy God." What a funny lot of things art is to Mr. Gill and how curiously he disregards all his theories when once he has his hammer and chisel in his hands and lets his inspiration rip! In front of one of his exquisite figures one forgets all about Truth, Goodness, God and the rest, and is filled with the simple emotions of admiration which never fade in the presence of masterpieces. And who more competent to adorn buildings of any shape or size or modernity than Mr. Gill? He jeers at the plain and simple and practical styles of modern architecture, and yet his own work more than that of any other sculptor seems to belong essentially to modern types of buildings (as a glance at the "Underground" building will show). By comparison the figures that adorn the portals of Chartres are merely stuck on adhesively, as so often in Gothic work. For the Gothic building, by its nature, no more presupposes sculpture than does the "Catholic altar" which, according to Mr. Gill, seems to demand a statue as a necessity. Far from it: altars, ambons, archivolts, screens and reredoses can and do exist without an atom of sculpture and, when it is added, it seems all too often to be intrusive and adherent. Mr. Gill is too deeply involved with his God to see the errors of man, and man made more sculptural errors in the Middle Ages, in the way he placed his statues, than at any other period of art. Why, he was even driven to invent that Christmas tree ornament—the gargoyle—as an excuse for tacking on to an otherwise excellent building some

curious freak of the artist's imagination which, had there been private museums and collections, would really have been destined for the showcase. *Faute de mieux* they stuck it on a church. No, Mr. Gill, your Gothics were Goths and they had a Christmas Tree complex more violent than we have to-day. From their errors we learn much. Above all we learn that a Romanesque or Gothic sculpture looks far finer in a Museum than on a church because it then stands a chance of being seen properly. Thanks to the Greeks, who conveniently forgot all about God, sculpture was given a start, at any rate in the architectural world. The invention of Caryatids, metopes and friezes was a move in the right direction—it gave sculpture a chance. But the Greeks have not said the last word. Modern building indicates a reversion to the same sort of simplicity that the Greeks knew: with that simplicity goes a desire for limited adornment of buildings, not with the adhesive figures of Gothic art, still less with the suffocating sprawlings of Jesuit Baroque, but with just precisely those essential sculptural additions that give the finish to what would otherwise be fleshless bones. Sculpture in architecture, and especially in modern architecture, as I conceive it, is the crystallisation into form (human or otherwise) of what is otherwise merely structural. When a Greek made a bronze mirror he found that the structure of it suggested certain shapes to him. He was an animist and feared no god. He saw implicit in every structure some lovely shape which, as long as the structural harmony was maintained, he evoked with his consummate art. So his simple mirror—a circle of bronze supported by a handle (just like any modern mirror) became in his hand a sphere supported by an exquisite little draped figure of a girl. He combined structure with art, shape with sculpture. In a word he saw that the architecture of a thing held latent sculptural possibilities.

The problem of the modern architect is to find out exactly at what point those sculptural possibilities can be developed. In a Gothic church they were never evident at all. In a Greek temple there was just a chance for them. In a modern building, there is, strangely enough, even more chance for sculpture than there has ever been before, provided that the sculpture is formal and not realistic. For where the formality of sculpture ends the formality of architecture begins and the two meet on that common ground; in fact some of the more advanced "abstract" sculpture is on the very point of junction itself, it is architecture blossoming into sculpture.

Personally, I believe that it is only thanks to what Mr. Gill calls our "intellectual disunion, religious decay, economic instability and mechanical triumph" that we are at last forging ahead. Our world is no longer standardised, stabilised and case-hardened as it was when Mr. Gill and I were boys, or as it was when England slumbered under a religious uniformity which suffocated invention and independence. Economic instability makes life exciting, to say the least of it, while "mechanical triumph" has given us quite a lot of new ideas in art. Cheer up, my dear Gill, we have burst our bonds at last!

STANLEY CASSON.

NOTES ON BOOKS

HENRY IRVING. By Gordon Craig. London: J. M. Dent & Sons. 15s.

In the whole of this fascinating book about Henry Irving perhaps the most revealing words are those quoted by Mr. Gordon Craig as the first letter he received from Henry Irving dated The Grange, Brook Green, Hammersmith, 1886, on the occasion of his fourteenth birthday:

"Make good use of your time, for fast time flies ; therefore spend this sovereign as quick as possible. Henry."

There is one golden rule of conduct but it is a very dangerous one and it is not to be practised by fools. Yet it is a divine command which all the greatest philosophers and teachers would wish their pupils to be capable of. It is this: "Give royally, praise magnificently." To carry out this precept so as not to make a shameful spectacle one must possess the instinct of the true artist. It is the merit of Mr. Gordon Craig's book that he makes the reader realise that Henry Irving was such an artist and in quite a different category to that type of efficient business man of the theatre who, whether in the capacity of actor, financier, producer, scenographer, architect or manager receives more than he gives.

The record piece of advice Craig received from Irving he relates as follows: "He said that he thought that out of my five pounds a week—'You—er—get, I believe, that sum—er—weekly'—I ought to be able to afford some books." This is important because it makes clear at once that this great actor, who was as packed with instinct as an artist must be, was also a student and believed in study and not merely in "inspiration."

Irving was all for these slight significant touches. Anything sprawling was simply not Irving. With him all had to be delicate, economical work—all done in sharp-cut lines—no bungling, no rough and tumble. Spontaneity he valued, but seldom indulged in: what he did he did by design. He did not respect that artlessness which fails to reveal art. He was not merely fond of his art—his art of acting was his religion. To be playful and go-as-you-please about it—to be spontaneous, unless by the grace of God—was to him a sign of idiocy.

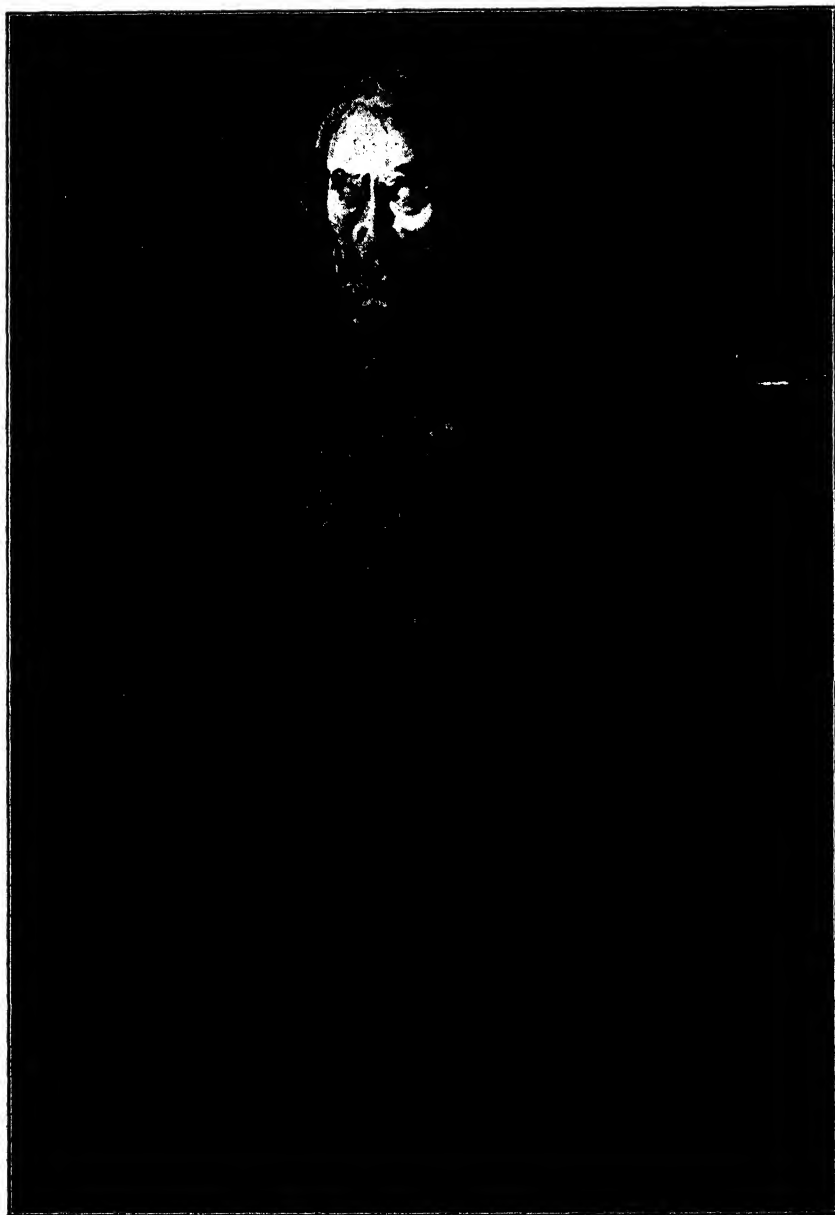
There seems to have been a day when, after witnessing what is called 'an inspired performance of genius,' 'full of feeling,' he took himself aside and said: "My boy, listen to me. In the next twenty or thirty years you may be called upon to perform some eight thousand times, and as you may possibly not feel inspired each time you perform, you may, during the course of a strenuous role, not feel inspired for more than—er—let us say—um—ten minutes per act. I think, therefore, you will do well to remember that by taking great pains you can, shall we say—um—*design* a part, a rôle, so carefully that, inspired, or not, you'll be demmed interesting. The less 'feeling' the better. See what I mean, my boy?"

From Mr. Craig's book, those who never saw Irving will recognise at once that he was in his field the highest type of artist, the artist with more than a touch of the demoniacal. This is perfectly expressed by Mr. Craig (whose outstanding virtue among men of the theatre to-day is his instinct for the real thing) when he says:

"'But was he natural?' is always being asked. Indeed, he was—natural like lightning—but not natural like the ape. Some there are who will for ever think that to be commonplace is to be natural."

Those words deserve to be printed in letters of gold for they expose the whole modern fallacy of realism. There are so many people who, as Mr. Craig says: "find it very natural in an actor to drift on and off the stage, or tactfully to avoid saying or doing anything that might astonish anyone in the audience—to look and act as much like a cypher as possible—slightly sleepy about the eyes—toll-loll. To these then, it must appear that if an actor is expressive he is unnatural; if he astonishes he is positively eccentric; if he is dramatic, a scandal. Irving was astonishing us always. . . ."

It is an interesting fact that in all the arts the great artist is the man who can combine design with surprise, intellect with inspiration, quiet control with demoniacal



power. And strange it may seem but it is nevertheless true that the greater the force the greater the control.

Mr. Gordon Craig has written one more illuminating book and it is to be hoped that the world of the theatre will more and more respond to his ideas.

W. J. TURNER.

GENERAL NOTE

THE TWENTIETH ENGLISHWOMAN EXHIBITION OF ARTS AND HANDICRAFTS.—The well-known annual Englishwoman Exhibition of Arts and Crafts will be opened at 12 noon on Wednesday, November 12th, at the Central Hall, Westminster, and will remain open until Saturday, November 22nd (11 a.m. to 7 p.m. each day). The Exhibition, which is under very influential patronage, will comprise exhibits of almost every description of arts and crafts, including jewellery, pottery, weaving, wood-carving, furniture, leather work, printing and bookbinding, silver and metal work, lampshades, embroidery, lace, toys, enamelled glass and a large variety of other articles. There will be daily demonstrations in pottery making, weaving, spinning and printing. The Exhibition offers an admirable opportunity for purchasing attractive Christmas presents at reasonable prices.

MEETINGS OF OTHER SOCIETIES DURING THE ENSUING WEEK

MONDAY, NOVEMBER 10.—Automobile Engineers, Institution of, at the Institution of Electrical Engineers, Savoy Place, W.C. 7 p.m. (1) Mr. G. J. Shave, "Passenger-carrying Vehicles." (2) Mr. C. le M. Gosselin, "Goods-carrying Vehicles." (Joint Meeting with the Institute of Transport and the Commercial Motor Users' Association.)
Brewing, Institute of, at Charing Cross Station Hotel, Strand, W.C. 7.45 p.m. Dr. L. R. Bishop, "The Practical Application of the Results of Research to Reproduction of Malts and Brewery Worts."
Electrical Engineers, Institution of, Savoy Place, W.C. 7 p.m. Informal Meeting. Discussion on "V.I.R. Cables; their Failures, their Future and their Rivals"—opened by Mr. A. F. Stevenson.
At Armstrong College, Newcastle-on-Tyne. 7 p.m. Mr. D. B. Hoseason, "The Cooling of Electrical Machines."
Geographical Society, Kensington Gore, W. 5 p.m. Dr. F. A. Vening Meinesz, "Gravity Anomalies in the Indian Archipelago."
Metals, Institute of, at 39 Ehnbank Crescent, Glasgow. 7.30 p.m. Mr. N. C. Marples, "The Applications of High-Nickel, Nickel-Copper Alloys and Pure Nickel in Industry."
Surveyors' Institution, 12 Great George Street, S.W. 8 p.m. Presidential Address by Mr. E. H. Leeder.
University of London, at King's College, Strand, W.C. 5.30 p.m. Prof. R. W. Seton-Watson, "The History of Serbia. Lecture V—Serbia under Milos and Michael (1830-42)."
At the School of Oriental Studies, Finsbury Circus, E.C. 4.30 p.m. Prof. H. Dodwell, "The Historical Geography of India." (Lecture V.)
At University College, Gower Street, W.C. 5 p.m. Dr. L. E. Bayliss, "The Respiratory Functions of the Blood." (Lecture I.)
5.30 p.m. Prof. G. Murray, "Aeschylus, the Creator of Tragedy." (Lecture II.)

TUESDAY, NOVEMBER 11.—Automobile Engineers, Institution of, at the King's Head Hotel, Coventry. 7.30 p.m.
(1) Mr. G. J. Shave, "Passenger-carrying Vehicles."
(2) Mr. C. le M. Gosselin, "Goods-carrying Vehicles."
Electrical Engineers, Institution of, at the Hotel Metropole, Leeds. 7 p.m. Dr. B. Leggett, "The Medical and Surgical Applications of Electricity."
At the Engineers' Club, Manchester. 7 p.m. Mr. D. B. Hoseason, "The Cooling of Electrical Machines."
Empire Society, at the Hotel Victoria, Northumberland Avenue, W.C. 8.30 p.m. Major General Sir Fabian Ware, "The Work of the Imperial War Graves Commission."
Heating and Ventilating Engineers, Institution of, at the Milton Hall, Deansgate, Manchester. 7 p.m. Mr. A. Hindley, "Some Unusual Jobs."
Marine Engineers, Institute of, 85 The Minories, E.C. 6 p.m. Eng.-Lt.-Commr. S. F. Dorey, "Tubes for High Pressure Water-Tube Boilers."
Mechanical Engineers, Institution of, at Swansea. 6.30 p.m. Address by Mr. G. E. Hider (Chairman of the South Wales Branch).
Metals, Institute of, at the Y.M.C.A., Swansea. 6.15 p.m. Dr. A. W. Brownson, "Alloys—Some Reasons for their Composition."
Petroleum Technologists, Institution of, at the ROYAL SOCIETY OF ARTS, Adelphi, W.C. 5.30 p.m. Prof. A. W. Nash, Mr. H. M. Stanley and Mr. A. K. Bowen, "Synthetic Lubricating Oils."
Photographic Society, 35 Russell Square, W.C. 7 p.m. Meeting of the Kinematograph Group.
Royal Institution, 21 Albemarle Street, W. 5.15 p.m. Dr. C. D. Ellis, "New Aspects of Radio-activity." (Lecture II.)
University of London, at King's College, Strand, W.C. 5.30 p.m. Prof. Sir B. Pares, "Contemporary Russia. Lecture VI—Far East Policy. The Japanese War."
At University College, Gower Street, W.C. 5.30 p.m. Prof. T. E. Gregory, "Newmarch and his Contemporaries." (Lecture IV.)

WEDNESDAY, NOVEMBER 12. . Abattoir Society, The Model, at the Royal Sanitary Institute, 90 Buckingham Palace Road, S.W. 5 p.m. Sir James Douglas, Bt., "The Animals' Protection Act of 1911 in relation to work in Slaughterhouses." (Benjamin Ward Richardson Memorial Lecture.)

Anthropological Institute, at the Portland Hall, Little Titchfield Street, Oxford Street, W. 5.30 p.m. Mr. A. M. Hocart, "Spirit Worshipers of the South Seas."

Central Asian Society, at 74 Grosvenor Street, W. 5 p.m. Mrs. Lindfield Soane, "Some British Problems in Palestine."

Civil Engineers, Institute of, Great George Street, S.W. 6 p.m. Informal Meeting. Mr. Harold Berridge, "The Mechanical Characteristics of Clays, with special reference to the Construction of Engineering Works."

Egypt Exploration Society, at Burlington House, W. 8.30 p.m. Mr. R. W. Slaney, "Primitive Methods of Measuring Time: with special reference to Ancient Egypt."

Electrical Engineers, Institution of, at the Municipal College, Portsmouth. 7.30 p.m. Mr. R. E. Horley, "Oil-Filled Cables."

Engineering Inspection, Institution of, at the ROYAL SOCIETY OF ARTS, Adelphi, W.C. 5.30 p.m. Mr. C. L. Nordon, "Some Legal Clauses and Consequences of Engineering Contracts."

Fuel, Institute of, Burlington House, W. 6 p.m. Mr. James Cunningham, "Graphical Methods of Fuel Control."

Literature, Royal Society of, 2 Bloomsbury Square, W.C. 5 p.m. Mr. Harold Child, "Some English Utopias." Mechanical Engineers, Institution of, at the Hotel Metropole, Leeds. 7.30 p.m. Address by Mr. J. H. Jackson (Chairman of the Yorkshire Section).

Public Health, Royal Institute of, 37 Russell Square, W.C. 4 p.m. Prof. Dr. R. Stenhouse Williams, "The Importance of a Complete Study of the Nutritional Value of Milk."

Structural Engineers, Institution of, at the College of Technology, Manchester. 7 p.m. Paper by Mr. Oscar Faber.

United Service Institution, Whitehall, S.W. 3 p.m. Squadron-Leader the Hon. R. A. Cochrane, "The Work of the Air Force in Aden."

University of London, at King's College, Strand, W.C. 5.30 p.m. Mr. D. S. Mirsky, "Russian Literature in its Relation to Russian Social History (1740-1860)—Lecture V—Gogol." 5.30 p.m. Mr. G. Selridge, "Professions and Careers. Lecture VI—Business."

King's College, at 40 Torrington Square, W.C. 5.30 p.m. Mr. N. B. Jopson, "The Early History and Civilisation of the Slavs." (Lecture I.)

At the London School of Economics, Aldwych, W.C. 6 p.m. Dr. M. Culpin, "Modern Views of Nervous Troubles." (Lecture II.)

6 p.m. Lecture on "Office Machinery" (VI).

At University College, Gower Street, W.C. 3 p.m. Dr. C. Pellizzi, "La Lirica del Paradiso." (Lecture II.) (In Italian.)

5.30 p.m. Mr. L. A. Burgess, "Public Libraries in Wales."

5.30 p.m. Mr. I. C. Gröndahl, "Norway, the Land and the People." (Lecture II.)

THURSDAY, NOVEMBER 13. . Aeronautical Society, at the ROYAL SOCIETY OF ARTS, Adelphi, W.C. 6.30 p.m. Mr. H. L. Stevens, "Testing the Control of Aeroplanes."

Antiquaries, Society of, Burlington House, W. 8.30 p.m. Asiatic Society, 74 Grosvenor Street, W. 4.30 p.m. Mr. J. V. S. Wilkinson, "Persian Book Illustration."

Auctioneers' and Estate Agents' Institute, at Birmingham. Conference of Agricultural Members.

Electrical Engineers, Institution of, at University College, Dundee. 7.30 p.m. Mr. D. B. McKenzie, "Automatic Railway Control."

Historical Society, 22 Russell Square, W.C. 5 p.m. Miss Evelyn S. Procter, "Materials for the Reign of Alfonso the Wise of Castile, 1252-1284."

L.C.C. Geffrye Museum, Kingsland Road, E. 7.30 p.m. Mr. Arthur T. Holton, "The Furniture and Decoration of Robert and James Adam."

Marine Engineers, Institute of, 85 The Minories, E.C.3. 7 p.m. Mr. E. R. Hall, "Waste Heat Recovery."

Mechanical Engineers, Institution of, at Halifax. 7.30 p.m. Mr. W. Alderson, "The Influence of Fashion in Machine Design."

Metals, Institute of, at the Chamber of Commerce, Birmingham. 7 p.m. Discussion on "Metals and Alloys of the Future"—opened by Dr. W. H. Hatfield.

Oil and Colour Chemists' Association, at Russell Square, W.C. 7.30 p.m. Mr. J. S. Jackson, "The Constitution and Properties of Bitumen."

Photography Society, 35 Russell Square, W.C. 7 p.m. Meeting of the Colour Group.

Royal Institution, 21 Albemarle Street, W. 5.15 p.m. Prof. J. B. S. Haldane, "The Physiology of Water." (Lecture II.)

Structural Engineers, Institution of, 10 Upper Belgrave Street, S.W. 6.30 p.m. Mr. C. H. Cottew, "A Comparison of English and Foreign Building Laws."

University of London, at King's College, Strand, W.C. 5 p.m. Dr. W. Robson, "The Metabolism of Proteins." (Lecture I.)

5.15 p.m. Mr. R. S. Dower, "Social and Political Ideas of Some Representative Thinkers of the Age of Reaction and Reconstruction. Lecture VI—John Stuart Mill and the Philosophical Radicals."

5.30 p.m. Dr. P. A. Browne, "The Meaning of Music."

5.30 p.m. Mr. A. F. Meyendorff, "Russian Democracy." (Lecture II.)

At University College, Gower Street, W.C. 5 p.m. Prof. E. A. Gardner, "Greek Myths and Their Representation in Art." (Lecture V.)

5.15 p.m. Prof. J. E. G. de Montmorency, "Momentous Law Suits and Trials in various Countries from Classical to Modern Times." (Lecture I.)

5.30 p.m. Miss E. J. Davis, "Re-plannings of London, c. 1520-1920." (Lecture II.)

Victoria and Albert Museum, South Kensington, S.W. 5.30 p.m. Mr. W. G. Constable, "English Medieval Painting."

FRIDAY, NOVEMBER 14. . Astronomical Society, Burlington House, W. 5 p.m.

Chadwick Public Lecture, at 9 Conduit Street, W. 8.15 p.m. Mr. J. H. Coste, "The Object and Methods of Sewage Treatment, particularly in relation to Inland Towns and Isolated Institutions."

Chemical Industry, Society of (Chemical Engineering Group), at the Carville Power Station, Newcastle-upon-Tyne. 6.30 p.m. Mr. W. S. Coates, "Caustic Embrittlement."

Illuminating Engineering Society, at the ROYAL SOCIETY OF ARTS, Adelphi, W.C. 6.30 p.m. Mr. J. A. Macintyre, "The Lighting of Offices and Public Buildings."

Metals, Institute of, at Applied Science Department, University of Sheffield. 7.30 p.m. Dr. H. Hyman, "Unsoundness in Metals."

North-East Coast Institution of Engineers and Shipbuilders, at the Mining Institute, Newcastle-upon-Tyne. 6 p.m. Mr. E. F. Spanner, "Disembarkation of Passengers in Emergency at Sea."

Structural Engineers, Institution of, at the Chamber of Commerce, Birmingham. 7 p.m. Informal Meeting. Discussion on "Stresses in Angle Sections"—opened by Mr. F. C. Bridge.

University of London, at King's College, Strand, W.C. 5.30 p.m. Prof. J. L. Hotson, "Shakespeare and the Public Records."

5.30 p.m. Col. M. MacLeod, "Military Survey." (Lecture I.)

5.30 p.m. Mr. S. Runciman, "Constantine Porphyrogenetus."

At the London School of Economics, Aldwych, W.C. 2.30 p.m. Dr. W. Rose, "German Life and Literature from 1770 (with special reference to the Life and Works of Goethe)." (Lecture V.)

SATURDAY, NOVEMBER 15. . L.C.C. Horniman Museum, Forest Hill, S.E. 3.30 p.m. Mr. H. St. G. Gray, "The Lake Villages of Somerset."

Royal Institution, 21 Albemarle Street, W. 3 p.m. Mr. A. Hamilton Smith, "Some Recent Archaeological Work in Italy." (Lecture II.)

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